

COMPUTERWORLD

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Weekly Newspaper

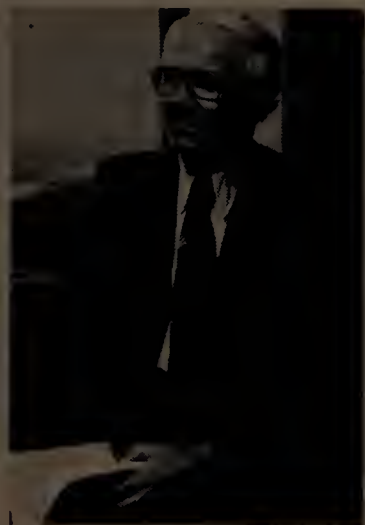
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September 12, 1983

Vol. XVII, No. 37

He grew up a Midwest farmboy with a fascination for electronics and went on to become chairman of the board of a highly successful computer firm. Computerworld talks with Control Data Corp.'s William Norris. Follows Page 100.



Inside

Citing poor demand, 3M Corp. will pull out of the 14-in. removable hard disk market by the end of this year. Page 2.

Jumping on the Unix bandwagon, Nixdorf Computer Software Co. introduced a time-sharing system compatible with that operating system for IBM mainframe computers. Page 4.

In what could signal a fast-approaching day of reckoning for software and hardware copycats, a U.S. Court of Appeals has upheld a suit filed by Apple Computer, Inc. against Franklin Computer Corp. and taken a strong stand on software copyrightability. Page 5.

Opinions on programmer productivity range from "no such thing" to programmers themselves and their productivity may not even be necessary. The first step, it seems, is to define what the phrase means. Page 101.

Intecom, Inc. has scaled down its Integrated Business Exchange private branch exchange so that smaller offices and branches of large firms can get a crack at its voice and data switching capabilities. Page 117.

Gould, Inc. has unveiled a cache memory-based disk controller that reportedly boosts the performance of its Concept/32 superminis by a factor of three. Page 131.

ADR Application Developer Targets Programmers, Users

By Paul Gillin
CW Staff

NEW YORK — Applied Data Research, Inc. last week introduced an application development system for IBM mainframes that is said to provide full interactive facilities for design, coding, testing and maintenance of on-line and batch programs, including large commercial applications, using a high-level language.

The system, called Interactive Development Environment for an Application's Life Cycle (Ideal), operates in IBM 370, 4300 series, 30 series and plug-compatible mainframe environments.

The company claimed that Ideal is "suitable for developing all applications an organization ever needs to develop," according to Stephen Gerrard, director of data base management system product marketing. It will compete in the same arena as Cullinet Software, Inc.'s ADS/Online; Cincom Systems, Inc.'s Mantis; and Software AG of North America, Inc.'s Natural, a spokesman said.

When used in tandem with ADR's Datacom/DB DBMS and Datadictionary products, Ideal provides relational data base management with an active data dictionary under a fourth-generation language designed for

both nontechnical end users and programmers, the vendor said. The language reportedly can be used to define data, panels, application reports and procedures without requiring knowledge of operating system, DBMS or teleprocessing functions.

Ideal currently can be used only with Datacom/DB and Datadictionary, which adds another \$100,000 to the price tag for Ideal under OS, Gerrard said. No interfaces to

other DBMS are planned at this time.

Gerrard said that Ideal, which has been under development since 1978, is intended to cover the entire development needs of a business, whereas most fourth-generation methodologies "target only one subset of the application backlog." He said high-level languages typically address one kind of application and one kind of user
(Continued on Page 6)

Industry Spotlight

Micro Explosion Forces T/S Vendors to Refocus

By Paul Gillin
CW Staff

For the same reasons that 1982 was the year of the microcomputer, it was a year many vendors of remote computing services would rather forget.

With its accessibility, ease of use and dedicated processing power, the micro captured the fancy of the end-user audience to which remote computing has traditionally appealed (story on Page 16). The proliferation of fourth-generation languages and other user-oriented soft-

Charts that detail the services of the top 10 time-sharing vendors begin on Page 17.

ware for in-house use made further inroads.

The results were a down year for many remote computing services vendors, particularly those that specialize in providing raw computing power, and a new urgency among many players to carve out niches in specialized markets.

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HACKING

Mark of Genius or Plain Theft?

By Jeffery Beeler

CW West Coast Bureau

MENLO PARK, Calif. — They are young, talented and consumed by an intense desire to learn how computer systems work and to extend the limits of their technical expertise.

They yearn to have their intellectual achievements recognized, but their special abilities are largely unappreciated by their parents, teachers and peers.

To satisfy their cravings for recognition and to demonstrate their technical maturity, they tackle the challenge of overcoming data security safeguards. Using their own personal computers, they routinely gain unauthorized access to corporate and government

mainframes throughout the U.S.

Most of the time, their youthful experimentation and game-playing attract only minimal attention.

But occasionally, their electronic intrusions are so daring or extensive that they find themselves thrust unexpectedly into the public spotlight.

Such was the case with the celebrated episode involving a group of Milwaukee youths who recently pierced the data security and rummaged through files at dozens of commercial and federal computing sites [CW, Aug. 15]. Their alleged victims included the Los Alamos National Laboratory, Security
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Declining Demand Cited

3M to Drop Rigid Disk Production

By Patricia Keefe
 CW Staff

WEATHERFORD, Okla. — Citing declining demand, 3M Corp.'s Data Recording Production Division will phase out the production of 14-in. removable rigid disks by the end of the year.

However, customer support and

warranty repair work will continue to be supplied to users of 3M disk packs and cartridges, a spokesman said. Also announced was the conversion of manufacturing facilities here to produce flexible and next-generation magnetic media.

Despite a recent report by Venture Development Corp. that predicts the

hard disk market will grow to \$17.8 billion by 1986, 3M characterized the declining demand for its still profitable rigid disk as "a trend expected to continue." In turn, the rapidly growing diskette market "has dictated that the [hard disk] facilities be made available for their manufacture."

The result is not so much a shift as an expansion of 3M's focus on the microcomputer and peripheral market, with the vendor "gearing up to be ready for the sub-5-in. disk segment or whatever the market needs," the spokesman explained. The move away from hard disk production will not affect optical disk projects at 3M.

Some flexible disk production is currently under way at the plant here, which will require a sizable expansion effort nonetheless, according to the spokesman. But "there are probably a number of ways in which the production of flexible media can be made more cost-effective than that of rigid disks," he said.

STC Offers Dual Processor To Compete With IBM 4341

WALDWICK, N.J. — STC Ultimate Systems, Inc. has announced the USX44, an IBM-compatible dual processor that reportedly offers roughly the same performance as IBM's 4341 Model Group 2 processor.

The USX44 offers from 2M to 8M bytes of main memory and supports between three and eight channels on each processor. The unit is equipped with a built-in fail-soft capability that the vendor said increases system performance and availability.

The processors used in the USX44 are modified versions of Magnuson Computer Systems, Inc. M80/32 systems, according to the vendor.

An entry-level processor with 2M bytes of main memory and three channels on each processor costs \$287,389, including two Storage Technology Corp. 8650 A series dou-

ble-density disk drives, a triple-density tape controller, a triple-density tape drive and a 1,500 line/min printer.

An 8M-byte, six-channel configuration, including two 8650 A series disk drives, a triple-density tape drive and controller and a 1,500 line/min printer, costs \$357,529, the vendor said.

The 2M-byte configuration is available for \$6,785/mo on a five-year lease agreement. The 8M-byte configuration leases for \$8,441/mo on a five-year plan. Maintenance for the processors costs \$2,961/mo for a 2M-byte processor and \$3,361/mo for an 8M-byte processor.

The vendor, which is a subsidiary of Storage Technology, is located at Four North St., Waldwick, N.J. 07463.

Correction

Computerworld incorrectly reported an increase in the price for Tewksbury, Mass.-based Visual Technology, Inc.'s Visual 300 and Visual 330 display terminals [CW, Sept. 5]. Effective immediately, the price, actually a reduction, is \$995.

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Nixdorf Unwraps Unix-Compatible T/S for IBM

RICHMOND, Va. — Nixdorf Computer Software Co. (NCSC) has announced a Unix-compatible time-sharing system for IBM mainframe computers running IBM's DOS/VS(E) and under Nixdorf's Edos/VS and Edos/VSE operating systems.

Called Programmer Work Station (PWS)/VSE-Advanced Functions (AF), the product is based upon Coherent, a Unix implementation developed by Mark Williams Co. of Chicago. The design permits the use of Unix tools and techniques for software development in a teleprocessing environment under DOS.

PWS/VSE-AF incorporates the facilities of the Unix programmable command processor, redirected I/O, pipes and filters. Over 100 utility and system control processors are supplied, a spokesman said. In addition, NCSC supplies interfaces to standard IBM system libraries and spooler files and supports access to system and private source statements, relocatable and procedure libraries as well as the NCSC partitioned data set library. Spooler support is available for IBM's Power/VS and VSE/Power facilities and Nixdorf's Extended Spooling Facility of Edos/VS and Edos/VSE.

Full screen editing is supported for IBM 3270 terminals, both local and remote. A Unix editor and screen editor is also available. The

full screen editor provides for user-defined programmed function key command strings and supports the same command syntax as Unix editors.

Growing Body

The product is intended to address the growing body of microcomputer-based Unix users who would like to transfer their knowledge to a mainframe environment, according to Mike Youmans, product manager for PWS/VSE-AF. "Unix is very popular in an academic environment, but when students go into business they have to relearn the operating system," he said.

Written in C, the time-sharing sys-

tem is designed to be transportable to other IBM operating systems in the near future, Youmans said. "We don't have a lot of DOS strings running through it," he said. Although NCSC does not see Unix replacing IBM operating systems in the foreseeable future, "We see facilities such as this within an IBM operating environment as at least a viable alternative," he noted.

PWS/VSE-AF maintains and controls a hierarchically organized file system identical in design to that of Unix, the vendor claimed. The file system may reside on either count key data or fixed-block architecture disks and provides for multiple directories and mountable file systems

defined in the same fashion as Unix.

The system allows a user to initiate and control multiple time-shared processes. Through shell procedures, each user can create new system functions to suit individual requirements.

A user without Unix knowledge can be using the system within 1½ hours, Youmans said, although a two-day training course is recommended. The product will be shipped to IBM users beginning in the first quarter of 1984. An introductory price of \$9,500 for a DOS site is available through the end of 1983, Youmans said. NCSC is located at 6517 Everglades Drive, Richmond, Va. 23225.

Announces Programmer Productivity Aid

Amdahl Updates VM/PE to Boost MVS

By Jeffrey Beeler

CW West Coast Bureau

SUNNYVALE, Calif. — Amdahl Corp. has updated its VM/Performance Enhancement (PE) facility with a release that reportedly boosts MVS' efficiency to near-native performance levels under VM and cuts the latter operating system's overhead to a bare minimum.

The debut last week of VM/PE Release 4.0 also coincided with the

company's announcement of a second program product named Session, which can reportedly improve programmer productivity by a widely variable amount.

Second Package

Amdahl credits the second software package with allowing VM users to initiate up to 12 concurrent terminal sessions from the same screen and to perform different jobs simultaneously in each session.

The product is also said to simplify the task of switching from one virtual session or terminal system to another. With Session, switching is accomplished with just one stroke of a program function key instead of a long, complicated sequence of keyboard commands, according to a company spokesman.

VM/PE 4.0 is the latest incarnation of a continually evolving product line that has already progressed through three earlier releases, the first of which appeared in late 1979. Each succeeding refinement has brought VM/PE one step closer to fulfilling Amdahl's ultimate aim of enabling MVS users in a VM environment to approximate native-mode performance levels as much as possible.

In the past, with VM/PE Release 3.0, MVS systems running under the master IBM control program could operate at 90% of native-mode performance or slightly higher. Now, with the most recent addition to the program product line, the guest operating system's maximum efficiency rating has risen to 98%, with a corresponding reduction in VM overhead, the Amdahl spokesman said.

Memory Doubled

Amdahl doubled the amount of processor main memory that VM/PE can accommodate and has further enhanced the series by increasing its compatibility with recently announced VM program products. Under Release 3.0, VM/PE was unable to operate with mainframes holding more than 16M bytes of main memory and could support only Release 1.0 of both VM/SP and the VM/SP High Performance Option (HPO). VM/PE 4.0, by contrast, supports a practical maximum of 32M bytes and is compatible with Release 2.0 of both

IBM's VM/SP and HPO program products, the spokesman said.

In addition, Amdahl has improved VM/PE's reliability by designing Release 4.0 to continue operating even when its VM host system shuts down and is being restarted, the spokesman added.

The improvements in the latest VM/PE release's performance result largely from a series of program code revisions that make possible an MVS virtual machine with its own dedicated storage and I/O. Instead of operating in the problem state under VM, this so-called Privileged Real Machine (PRM) is given over almost entirely to MVS, where the PRM runs in supervisor state and executes instructions directly, the spokesman explained.

Session Product

Like VM/PE, Session supports both Releases 1.0 and 2.0 of VM/SP. Session also operates with the IBM 3277 Model 2, 3278 and selected 3279 terminals or their functional equivalents and allows certain Ascii video displays to emulate a full screen 3278. Some of those Ascii units include the Digital Equipment Corp. VT100; Hazeltine Corp. 1500; Hewlett-Packard Co. 2621; IBM 3101; Lear Siegler, Inc. ADM-3A; and Televideo Systems, Inc. 925 and 950, the spokesman said.

Residing in its own virtual machine under VM, the Amdahl program product reportedly allows programmers to start a job in one session, then switch to a second session and do another task while the first proceeds without interruption.

Session's parallel processing capability contrasts sharply with earlier session-handling schemes, which forced users to put their existing programming tasks "on hold" every time they switched from one terminal system like CICS or TSO to another, the spokesman said.

Session and VM/PE can be obtained for an annual license fee of \$5,000/processor and \$20,000/processor, respectively, or for monthly per-CPU fees of \$500 and \$2,000. Both program products are available for shipment from Amdahl at 1250 E. Arques Ave., Box 3470, Sunnyvale, Calif. 94088.

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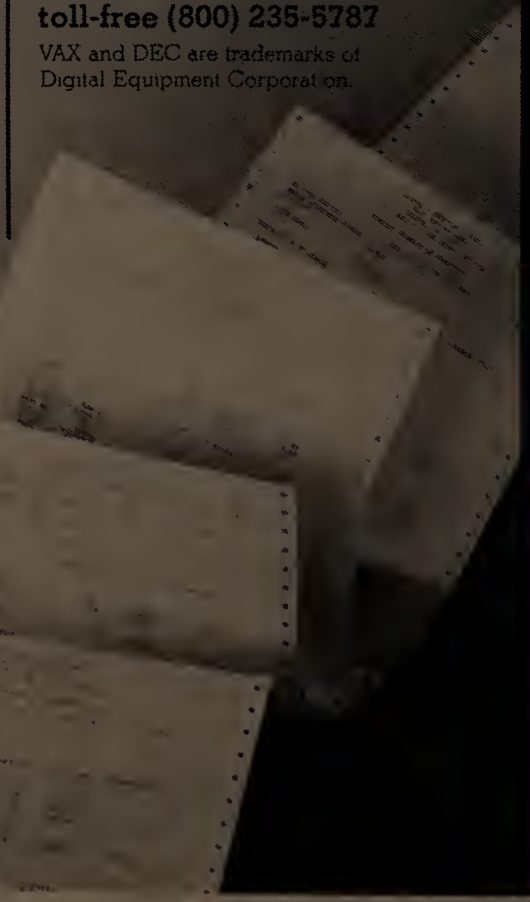
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Ruling Seen Definitive

Court Upholds Apple's ROM Copyright Suit

By Paul Gillin
CW Staff

PHILADELPHIA — In one of the strongest statements to date affirming the copyrightability of operating systems and computer programs embedded in read-only memory (ROM), a federal appeals court here has upheld a suit by Apple Computer, Inc. against Franklin Computer Corp., a Cherry Hill, N.J., maker of Apple-compatible microcomputers.

In reversing a lower court ruling that denied an injunction against sales of the Franklin ACE series, the U.S. Court of Appeals for the Third Circuit shed light on the legal shadows that have surrounded software copyright issues. Although the ruling is not the first of its kind, experts contacted by *Computerworld* agreed that it is the most significant statement by a high court recognizing the copyrightability of programs embodied in object code and particularly those embedded in ROM.

"I think it's one of the most definitive statements of the law that's been done yet," said Albert Eisenstat, Apple's vice-president and general counsel.

"The question of copyrightability of software has been somewhat up in the air, particularly programs on chips," said Robert Bigelow, an attorney and editor of *Computer Law and Tax Report*. "The third circuit is a very respected group and its decisions often carry a good deal of weight in other circuits."

The decision, which came more than five months after the case was argued before the circuit court, is "a relatively clear-cut, well-reasoned opinion on this particular point that will close it off, I hope," said Dan Brooks, a Washington, D.C., lawyer specializing in computer law. "I'm sure Franklin is going to appeal to the Supreme Court if necessary, but they should lose," Brooks noted.

However, a Franklin spokesman said the issue is by no means settled. The case has been remanded to the district court judge who initially denied the injunction to reconsider in light of the legal definitions provided by the circuit court. "We believe we'll prevail and the injunction will be denied," said Avram Miller, Franklin's executive vice-president and chief operating officer.

Franklin has filed a countersuit claiming Apple has tried to monopolize the market for Apple-compatible machines. "Apple has sought, in our opinion, to protect its computer design with a copyright," Miller said. "But we know of no other way to make a compatible machine without copying the software." In testimony, Franklin did not deny that it had copied certain Apple programs, but argued that the programs were not copyrightable by virtue of being a "process," "system" or "method of operation."

However, the decision written by Circuit Court Judge Darcy Sloviter stated, "The statutory definition of a

computer program . . . makes no distinction between application programs and operating programs." The decision continues, "We reaffirm that a computer program in object code embedded in a ROM chip is an appropriate subject of copyright."

The 16-month-old suit had drawn considerable attention from the computer community, particularly among microcomputer vendors who are feeling pressure from small competitors that offer low-cost compatible machines. The Association of Data Processing Service Organizations, Inc. (Adapso) last November filed a brief supporting Apple's claim.

A spokesman said the decision in the microcomputer case is significant for all vendors. "The particular programs at issue were micro programs, but these questions have been raised with respect to all computer programs, not just micros," said Adapso President Jerome Dreyer.

However, Brooks asserted that the Apple case was not likely to be the last legal battle over the copyright issue. "There are a lot of companies who are companies because they have somebody else's programs in their ROM. There are enough people like that out there that I'm sure you're going to see more of these [cases]."



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IBM Announces 3080 Price Cuts

RYE BROOK, N.Y. — IBM last week reduced purchase prices up to 14% on its large-scale 3083, 3081 and 3084 processors. At the same time, the firm also cut prices by 12% for most upgrades of its 3083 and 3081 mainframe computer systems.

The price reductions go into effect immediately, an IBM spokesman said.

Purchase prices for the smallest IBM processor, the 3083 Model Group E, have been dropped from \$1,120,000 to \$960,000.

ADR's 'Ideal' Targets Application Development

(Continued from Page 1)

and are hampered by cryptic coding structures that make them difficult to maintain. "Most [high-level languages] also address only the coding process, which is about 10% to 20% of the application development life cycle," he said. "Design, testing and maintenance are often conveniently left out."

A set-oriented language, Ideal is said to be tightly integrated with Datacom/DB, which utilizes compound Boolean selection. Datacom/DB's Relational Index System, which dynamically balances free index space without the need for traditional bit maps or block chains, makes possible high-performance joins and selects and project operations, according to ADR.

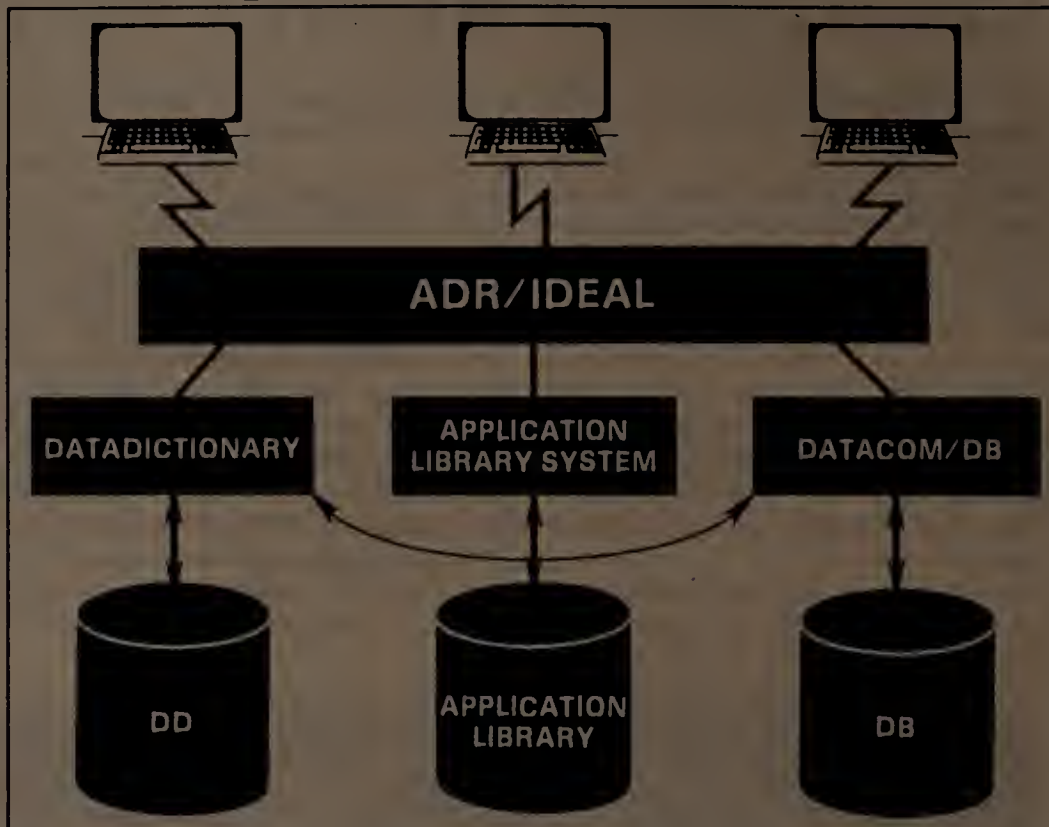
New access paths into the data base can be dynamically created without user knowledge, making Ideal access path-independent. Datacom/DB tables can be modified, reordered and related without disturbing Ideal applications, the vendor said.

Formats Displayed On-Line

Menu-driven, "fill-in-the-blank" screen formats are displayed on-line and processed interactively for declarative or descriptive portions of the application, ADR claimed. Ideal also includes a command language that allows the experienced user to bypass menus.

On-line Help facilities and intelligent editors are available. A split-screen function allows the screen to be divided into multiple regions, "using each region as a separate terminal," according to N. Adam Rin, Ideal product manager.

Ideal uses ADR's Datadictionary to control the application development process, a spokesman said. Datadictionary describes the content of Datacom/DB data bases and acts as a repository for control of data, programming resources and user authorization.



Components of ADR/Ideal

An application development model in Datadictionary includes complete definitions of all systems, programs, resources and users of the Ideal system, ADR said. It is transparently and automatically updated during development.

When an application is created, Ideal creates an entry in Datadictionary about the program and prompts the data administrator for resources that the application uses. Datadic-

tionary is updated to document those relations, and documentation can be retrieved on-line. Using split screen, Ideal and Datadictionary can operate together on the same screen.

Managed Simultaneously

With Datadictionary, Ideal can also support one production copy and multiple test and history copies of the same program, panel, report or data view, the spokesman said. Development and execution activities on different versions of a program can be managed simultaneously.

The high-level language can be used for design and development of application logic, computations, data base reference and maintenance and transaction processing, the vendor said. The language is data base-oriented and supports structured design and development methodologies.

Immediate delivery of Ideal is available for OS at a cost of \$75,000. DOS shipments are scheduled for January 1984. The product also requires Datacom/DB, which costs \$25,000, \$75,000 for OS and Datadictionary. More information on Ideal is available from ADR, located at Rt. 206 & Orchard Road, CN-8, Princeton, N.J. 08540.

Still Waiting for Tariff Changes

DDS Users Limited to Leasing Interfaces

WASHINGTON, D.C. — Dataphone Digital Service (DDS) users who have been looking forward to buying their own terminal interfaces and saving a little money in the process will have to wait awhile longer.

Although the Federal Communications Commission (FCC) last June ordered AT&T to eliminate tariff restrictions that have made it and other telephone carriers the exclusive providers of the DDS interface, it will be late next month at the earliest before the changes become effective.

The commission's June order climaxed an eight-year fight led by a modem manufacturers trade group, the Independent Data Communications Manufacturers Association (IDCMA), against the tariff restrictions. In addition to allowing DDS users to employ independently made DDS interfaces, which are officially known as channel service units (CSU), the phone company was ordered to unbundle charges for DDS transmission and terminal facilities and distribute interim technical stan-

dards governing the design of all new CSUs.

AT&T has filed the tariff changes and unbundled the charges, but it will not have the interim standards ready until later this month. Therefore, the FCC's Common Carrier Bureau has decided to leave the present tariff in effect until Oct. 22. DDS users will thus have to continue to lease telephone company-provided interfaces and pay bundled rates for DDS service.

By comparison, if the revisions were effective, users would have the option of buying CSUs from independent suppliers and paying an unbundled rate covering DDS transmission facilities alone.

One provision of the FCC's June order allows use of "grandfathered" CSUs — devices of a type then being used as DDS interfaces. Many of these devices, although provided by telephone companies, were produced by independent manufacturers. Under the revised tariff, these companies would be able to sell direct to end users.

According to the IDCMA, exercising the option would save a typical DDS user about \$35/mo.

Coding Guide Out For Cobol, Fortran

ESTILL SPRINGS, Tenn. — A uniform coding standard that can be applied as written or tailored to establish a company's programming practices has been announced by Associated Technology, Inc.

The 62-page guide covers documentation and coding practices for Cobol, Fortran and Basic.

Priced at \$23, the guide is available from the vendor at Rt. 2, Box 448, Estill Springs, Tenn. 37330.

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VMACCOUNT allows installations to specify projects to be charged. Thus, users may work on several projects in a session, but only those for which they've been authorized. You benefit by being able to offer a simple way to track a system such as Accounts Receivable.

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Milwaukee Youths Spark Inquiry Into Hacking

(Continued from Page 1)

Pacific National Bank and the Sloan-Kettering Cancer Center in New York.

In the law enforcement community and the public at large, they are often perceived as a menace, a band of juvenile delinquents, trespassers and vandals with a high-tech twist. But the youths themselves usually refer to their breed by a different name. They call themselves "hackers."

Because of adverse publicity stemming from the Milwaukee incident, "hacking" has received a black eye of late and has come to be identified with reckless snooping and even destructiveness. But in truth, most hackers are a reasonably responsible, admirable bunch whose actions are motivated mainly by curiosity and seldom pose a serious threat to the objects of their scrutiny.

So said SRI International, Inc. researcher Geoffrey Goodfellow, a self-proclaimed hacker who as a teenager in 1973 was found to have used a large nationwide time-sharing service without authorization.

'Darker Side'

Goodfellow defines hackers as individuals who delight in learning about computing, seek to stretch a system's capabilities, write code for the sheer fun of it and appreciate software's intrinsic beauty. But although he views hacking as primarily positive, he does concede the existence of a "darker side" to the phenomenon.

A comparative handful of hackers, he said, are little more than "malicious meddlers, poachers who try to discover information by poking around in other peoples' systems." Most hackers of the unsavory variety begin their hacking careers during their teens — some start as early as 14 — and usually move on to more socially useful enterprises when they hit their early to middle 20s.

Typical hackers, by the time they

become undergraduates, have either had their technical aptitude discovered and put to good use or they have "simply hacked themselves out," Goodfellow said. But until then, "hackers can probably best be described as loners looking for someone to appreciate their talents. In most cases, they're either first-born or only children and social outcasts who don't enjoy the same things as most other kids their age."

"Above all, they're misdirected. They don't have anyone who can take their abilities and turn them to the good side of the force rather than the dark side of the force."

Frustration Cited

Their frustration at not having their talent recognized and channeled in a constructive direction often prompts them to prove their technological manhood by raiding remote, private mainframes and circumventing their security safeguards.

Left to their own devices, most



hackers would gladly limit their systems snooping to relatively innocent activities like browsing through their targets' files. But if companies try to thwart the attacks on their mainframes by plugging the holes in their security armor, they run the risk of antagonizing the intruders and escalating the intensity of their next raids.

"Unfortunately, most mainframe

sites are run like police states, and when organizations first realize their systems have been broken into, they respond by erecting barriers," Goodfellow said. "This type of reaction is precisely the wrong approach to take," because hackers will notice the beefed-up defenses and see them as a challenge to their ingenuity.

Thus efforts to strengthen security safeguards will merely invite future attacks and increase the likelihood that the target systems will have their files deleted or suffer other serious, irreparable harm, he said.

Although he readily acknowledges the need for effective data security, Goodfellow urges large organizations not to adopt an "authoritarian" approach to unwanted systems users. "Try to befriend any hackers who break into your system," he advised mainframe operators. "Take an interest in what they're doing. If you ask them questions, most of the time you'll find they're more than happy to tell you exactly what they're looking for."

Tomorrow's Genius or Criminal?

Execs Speculate on Future of Hackers

By Peter Bartolik

CW Staff

Will today's hacker be tomorrow's programming genius, or will he turn out to be a criminal?

It all depends on how you look at it, based on the comments from high-level industry executives.

During Digital Equipment Corp.'s recent DECTown extravaganza, for example, company President Kenneth Olsen openly deplored the recent computer raids, but said the miscreants display characteristics that are the hallmarks of some of the best talent at Digital. "Those kids are not new to us," he told *The Boston Globe*. "They're the kind of people we hire."

Attempts to contact Olsen for further comments were unsuccessful, but conversations with other industry executives indicate some division over the subject.

Peter LaBriola, president of the Applications Products Division of Applied Data Research, Inc., agreed with Olsen's comment. "He's absolutely correct; it's the same with us," he said with a laugh.

Taking a sterner view was John Karcanes, a vice-president with Culinet Software, Inc. "In the first instance it may seem a bit funny, but the potential ramifications are serious. It stops being funny when you're talking about a Sloan-Kettering," he said, referring to the cancer

center reportedly raided by the Milwaukee gang just apprehended [CW, Aug. 22].

Falling somewhere in between was Jack Silverio, director of employee relations for Honeywell, Inc.'s Management Systems Division. "My feeling is the world — starting with my own children in middle school — is becoming more computer literate, and we [in industry] are encouraging that. This is an outgrowth, an expansion of that genius or brainpower we are encouraging."

On the issue of where a prank ends and a crime begins, the answers again varied.

LaBriola said he considers such actions as pranks if there is no intent to defraud, steal or gain access to trade secrets. But, he added, "that doesn't make it legal."

Silverio said only the courts can decide where the line is crossed.

Karcanes said the attention on hacking will force industry to put in safeguards over the next few years. "Legislation ought to come through that protects companies that have made an investment in [computer] security," he said.

All three, however, agreed the recent furor is likely to spur more hacking attempts as youths try to upstage each other. They also agreed in some form that it is up to industry to try and channel young computer wizards toward more legitimate endeavors.

"These are people," Silverio said, "who I suspect are the more brilliant, who are not being challenged enough; they are going out and challenging themselves. Our challenge is how to focus and channel that brainpower in more acceptable ways."

LaBriola said, "When you see those who are sufficiently competent, who do it through some exercise of competency and not through luck ... then I'd say the best approach is to rehabilitate them and to hire them."

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Organizations Step Up Internal Data Security Efforts

By Jeffry Beeler

CW West Coast Bureau

Large organizations are adopting a wide assortment of protective measures — some based on high technology, some not — in an effort to discourage data and systems misuse by their own employees.

The measures include intensified physical security, encryption, software packages to control access to central mainframes, regular shuffling of passwords, nondisclosure agreements and educational seminars aimed at increasing upper management's awareness of potential data integrity threats.

At least some of these safeguards are already in place at each of the large West Coast organizations that

'The only way we can control the problem [of data security breaches] is to make management aware that personal computers pose a potential threat . . . managers don't realize the possible damage their employees can cause simply by taking a diskette.' — Socal senior systems analyst Milind Amladi.

participated recently in a telephone minisurvey exploring the effect of personal computers on corporate data security.

One of the survey participants, Standard Oil Co. of California (So-



cal), is trying to guard its mainframe files against internal security hazards by boosting its investment in em-

ployee education.

"We've taken the approach that the only way we can control the problem [of data security breaches] is to make management aware that personal computers pose a potential threat," according to Socal senior systems analyst Milind Amladi. "Sometimes, managers don't realize the possible damage their employees can cause simply by taking a diskette."

As part of its consciousness-raising effort, the company is conducting a series of two-hour presentations and hands-on demonstrations aimed at familiarizing its 20 highest ranking executives with personal computers and their potential advantages. An expanded version of the one-on-one tutorials, which are still taking place, is also being offered to 200 of Socal's other top managers, who are attending the seminars in groups of six or eight.

In other security-related moves, the firm has enhanced its mainframe system with IBM's Resource Access Control Facility and has adopted a policy requiring its passwords to be changed routinely every 45 days, he added.

Access control software is also being used to prevent internal breaches of data security at the University of California's main computing center in Berkeley. To safeguard records being stored locally in personal computers, the university is stressing commonsense physical security precautions like anchor pads, locked rooms and careful storage of diskettes, according to the school's principal systems analyst, Alvin Begun.

Most of the data now residing in the university's roughly 20 personal computers is comparatively unimportant. Thus, "we haven't yet fully addressed the issue of how to protect our confidential personal computer-stored data because thus far there hasn't been any need to do so," Begun explained.

Micro Population Growing

But as the campus' microcomputer population rapidly grows, so too will the pressure to come to grips with the question of how the university's locally processed and stored files should best be safeguarded. "Unless we can find some foolproof protective measures — and I don't think we will — our final solution may simply be to keep our confidential data in our mainframes and not let it be downloaded at all," Begun said.

The data security precautions now in place or under consideration at the university contrast sharply with the safeguards at the San Mateo County, Calif., Office of Education, which operates a time-shared mainframe serving a statewide network of personal computers.

Part of the office's strategy for combating internal security threats revolves around encryption, which is reserved for the organization's most sensitive files only, according to system administrator Alvin Grossman. As a further shield against unauthorized accesses from the inside, the office requires all its new systems staff members to sign a statement explaining the importance of data security and specifying the penalties,

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Insiders Seen Posing Greater Threat To DP Security Than Outsiders

By Jeffery Beeler
CW West Coast Bureau

Insiders with a legitimate need to use their employers' mainframes pose a much greater threat to a big company's data security than "burglars" who break into systems from the outside.

That view was expressed almost unanimously by a group of large West Coast organizations that were telephoned recently as part of an informal survey probing the impact of personal computers on corporate data security.

Recent revelations about a group of Milwaukee teenagers who gained unauthorized access to mainframe files throughout the U.S. have reawakened public concern about data security breaches and their sometimes devastating consequences.

But almost all the postmortems of that highly publicized incident have focused on only one facet of the overall data security problem — the vulnerability of large time-sharing systems to attacks by outsiders. Nearly forgotten in the current media hubbub over the Milwaukee episode is a data security threat that many large user organizations and industry observers consider far more serious than the inquisitive meddling of youthful "hackers."

Threat From Within

The threat comes from within the user organizations themselves — or rather, from their malicious or unscrupulous employees, who can cause incalculable grief by damaging, disclosing or deleting key mainframe files.

Corporate insiders can gain access to sensitive data much more readily and wreak far more systems havoc than a typical outside invader for one simple reason: They are privy to all the necessary passwords and intimately familiar with the workings of their employers' computing environments, according to Dr. Alvin Grossman, systems administrator for the San Mateo County (Calif.) Office of Education.

Although no organization is entirely immune to data security breaches by its own employees, the problem is especially pronounced for large financial institutions. The reason is twofold, according to John Hoover, vice-president of district financial services for the Federal Reserve Bank of San Francisco.

First, as repositories for large sums of cash, financial institutions make extremely obvious and attractive targets for larcenous insiders with an entree to central mainframes. Second, few such organizations offer a dial-up capability that would permit external access to banking files and transactions. Thus, with rare exceptions, illicit use of a financial institution's data would be technically feasible only from within, Hoover said.

Systems intrusions that originate from the inside also pose a special hazard for time-sharing systems of the sort maintained by Grossman's organization. "If ours were a batch shop, the task of providing security would be comparatively simple,"

Grossman said.

"But for time-sharing systems of any sort, the problem becomes considerably more difficult. The more we try to do what we think is positive — in other words, the more we try to make our system user-friendly — the more we open it up to manipulation," Grossman bases his observations on personal experience. Earlier this year, he was forced to dismiss one of his systems staff members for divulging some of the Office of Education's highly confidential personnel records.

The recent arrival of personal computers on the corporate scene is

expected to have little measurable impact on the big business world's data security posture, most of the survey participants agreed.

In many companies, personal computers will serve basically the same function as a typical on-line terminal and, thus, will pose no security risks that large organizations have not already encountered with conventional time-sharing systems. From a security standpoint, "having a personal computer will be no different from having a terminal," according to Coopers & Lybrand management consultant Judy Ano.

Echoing Ano's sentiments is Alvin



Begun, principal systems analyst for the University of California's Systemwide Administration in Berkeley, Calif. "Right now, organizations are already using on-line terminals to gain access to central data bases," Be-

(Continued on Page 12)

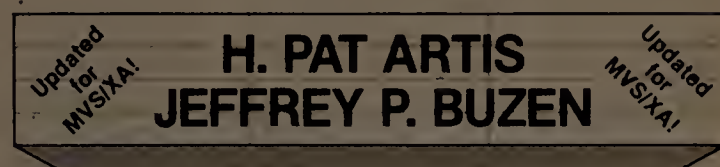


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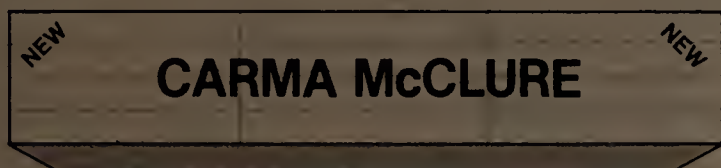
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Hackers Beware — Firms Can Go Into Your Files

By Jim Bartimo
CW Staff

Hackers, beware! If you're accessing your firm's computer system illegally, you should know that private corporations have virtual carte blanche to investigate your personal files.

Because the Fifth and 14th Amendments to the Constitution regarding privacy apply only to state and federal investigators, private internal security departments can investigate much further than the police or the Federal Bureau of Investigation.

Once investigators confer with a law enforcement agency, a set of privacy legislations then limits investigators. "As long as the internal audi-



tors don't talk to the federal or state people, they can go very far indeed," according to Jim Falco, assistant state

attorney in Dade County, Fla.

Files can be searched or taken away from employees in private industry because anything in the company's system is the property of the company. Only the common-law tort dealing with invasion of privacy applies, Falco said.

As a result of this freedom, internal security departments have the right to search any computer file any time with little or no reason. But according to the head of an internal security department at a major Connecticut corporation, internal security departments don't want or need to engage in "witch hunts."

"We have to maintain our credibility to be successful. We can't act just on allegations," the security in-

vestigator said. "We have to find support for an investigation and work closely with the legal and personnel departments. It's a very painstaking process."

Once wrongdoing is identified and documented by the department, the evidence is turned over to police who then turn it over to a prosecutor. Expert witnesses and information about how the crime was committed are often provided by the security and DP departments, the security investigator said.

An internal investigation department in a large corporation may employ only eight or nine people including administrative personnel, according to the security investigator who asked to remain nameless. These people often come from the FBI or other law enforcement agencies and earn an average annual salary of approximately \$30,000.

The investigator — who successfully helped prosecute an employee for embezzlement recently — said a security department is evaluated by the number of cases opened and closed, by the funds it recovered and by other criteria.

A less drastic measure than bringing in internal investigators may be to establish some commonsense security guidelines. Since many computer break-ins occur over dial-up lines, one policy could be to limit the accessible ports.

"We try to discourage any dial-up capability because if you have an open port, someone can get in," according to Lynn McNulty, director of information systems security for the U.S. State Department. "We try to get people to get a dedicated line for those applications."

McNulty also encourages managers to establish priority levels to ensure that certain information is unattainable to those who do not need it. Other measures to prevent unofficial use of the system include period printouts of all the files in the system.

Insiders Pose Greatest Threat

(Continued from Page 11)

gun said.

"So if you don't have adequate mainframe security under those circumstances, chances are you won't have it with personal computers either."

"On the other hand, if you do have adequate security safeguards in a time-sharing environment, personal computers probably won't be able to crack them."

An organization's security headaches are greatly magnified, however, once it begins to use personal computers for downloading important information from its central mainframes.

"Such data is a valuable corporate resource and certainly needs to be stored so that manipulation by outside people is impossible," Begun said.

The task of preserving the confidentiality of downloaded data is fast emerging as a "real tough issue," he added.

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Philadelphia (609) 228-6660 • Phoenix (602) 254-1927 • San Francisco (415) 872-1811 • Seattle (206) 575-1448 • Washington, DC (301) 459-3377.

Several Public Nets Dismiss Hacker Problem

By Patricia Keefe
CW Staff

Security measures at several public networks will apparently remain the same despite the widespread publicity generated in recent weeks by "network hackers" — home computer users who attempt to penetrate computer systems via dial-up networks.

Officials speaking for three of these networks — Compuserve (based in Columbus, Ohio); RCA Corp.'s Cylix Communications network (based in Memphis, Tenn.); and GTE Telenet Communications Corp. (based in Vienna, Va.) — denied that hacking is a problem at their respective services, although all agreed that systems violators should be prosecuted.

Two of the three spokesmen were reluctant to discuss what hacking costs their networks. At the same time, all three spokesmen expressed a belief that hacking incidents tend to be isolated events requiring a serious response.

These incidents are nowhere near as prevalent as the public may believe, was the general feeling of those contacted.

Customer Responsibility

The three network representatives agreed that the ultimate responsibility for protecting system data lies with the customer. Subscribers should change their passwords and access codes frequently, they recommended, but would not speculate as to how many of their customers follow that advice.

For some subscribers, all that stands between a systems violation and security is a simple password.

However, many such system passwords are reportedly easy to guess and are not changed frequently. Such was the claim of a group of young Milwaukee-based hackers that recently broke into about a dozen computer systems across the U.S. and Canada, including the Memorial Sloan-Kettering Cancer Center, New York [CW Aug. 22].

Compuserve, Telenet and Cylix take different tacks on the issue of security. "We make it clear [to the customer] that security is your responsibility. Only you know how valuable your data is, and you should take the appropriate measures," said Claudia Houston, public affairs manager for GTE Telenet.

The Telenet network was the vehicle used by the Milwaukee hackers to break into the computer systems.

Security Trade-Off

"Telenet is not in the security business," Houston said. If it were to add security to its system, there would be a trade-off in terms of user-friendliness and accessibility.

"Nevertheless," Houston said, Telenet "has a procedure to follow on a complaint [of suspected systems violation] that gets good, helpful information as a result of the accounting information the network keeps. We do cooperate with the appropriate law enforcement agencies and customers in providing information for use in tracking violators.

"That's all we'll say on the subject — we don't want to give our proce-

dures to the public," she said.

Ron Young, RCA Cylix's vice-president of marketing, maintains that "gaining access to Cylix is almost impossible."

No Hacking Here

A satellite-based network does not have hacking problems because intruders need sophisticated equipment, some of it proprietary, to help them break through about five levels of security before intercepting data, according to Young.

In comparison, "When you use a dial-up network, you are putting your data base in the hands of a third party [network]," he said.

Young believes that "networks are like any other commodity. Users



should make sure it fits their requirements before buying."

At Compuserve, security is consid-

ered a shared responsibility. "We have built-in safeguards, efficient security measures that are known to our customers," Richard Baker, corporate communications coordinator, said.

Compuserve actively encourages its subscribers to change their passwords by providing an on-line password changing program that provides users with guidelines and the ability to change passwords at any time, according to Baker.

Although the degree to which networks will supplement their subscribers' security efforts varies, standard procedures do exist, such as allowing only a limited number of unsuccessful access attempts before disconnection.

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Answer/DB provides online personal access to data.

Answer/DB requires no specialized computer background to use and doesn't even necessitate formal Answer/DB training.

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TP Monitor: IMS/DC _____

CICS/VS _____ TSO _____ CMS _____



THE SOFTWARE ENGINEERS

Hackers Steal Legislators' Attention

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The flurry of recent, highly publicized incidents involving young systems hackers accessing government and commercial data bases has re-focused attention on a variety of proposed and recently enacted computer crime laws, both state and federal.

Some 20 states have passed computer crime laws, and the federal statute, languishing on Capitol Hill since the late 1970s, is receiving new interest among legislators who previously considered computer crime an esoteric subject of the future (see related story).

The slow development of state laws until now has been little more than an academic undertaking, as forward-looking legislators sought to persuade their colleagues it was necessary to prepare for a growing criminal problem in the information society. Now, criminal justice authorities in several states are scrambling to bring those laws to bear or identify existing laws that will aid the prosecution of the growing number of apprehended hackers.

The '414s' Strike

The most notorious group of hackers of recent note are the so-called "414s," named after their Milwaukee area code, who have been at the center of the "computer crime wave" of recent months. Numbering only a handful, this group has been charged with unauthorized access of computer systems at the Los Alamos National Laboratory in New Mexico, the Memorial Sloan-Kettering Cancer Center in New York and several Milwaukee-area schools [CW, Aug. 27].

New Mexico and Wisconsin have computer crime laws that can be used by prosecutors, who so far are taking a get-tough approach to this mini crime wave. New York does not, but there are other laws that can be used, according to Susan Nycum, a Palo Alto, Calif., attorney specializing in computer law, who has looked into the case.

Nycum, of the law firm Gaston Snow & Ely Bartlett, said wire fraud statutes apply in this case, but the prosecutors will have to show that "a scheme or artifice to defraud" was involved. She noted the hackers probably did not intend to steal any information in the systems they attacked, but she said theft of the computer time involved would qualify.

Also, in the Los Alamos incident, she said "there is a

whole body of law directed at federal enclaves. It's my understanding [prosecutors] will try to rely on that" in their attempts to gain convictions of the "414" group.

Nycum said she talked to one of the defense attorneys in the case and was told the hackers "didn't have any malicious intent," that would probably be a major line of defense in any court proceeding arising from the in-

cidents. "I'm frankly very concerned about [that line of reasoning]," she said. "Some of [the hackers] don't understand what they've done." She added she is appalled at press accounts that seem to be "making folk heroes out of some of them."

She also said most states have "joyriding" laws that, differentiating between outright theft and theft without intent to keep, could provide

a precedent for prosecution of hackers.

Asked if she believes the recent publicity of hackers will lead to more state laws or enactment of the pending federal bill, Nycum said, "We'd have to find out they could not be prosecuted under the laws that do exist." She did say she is confident the publicity will increase pressure on data base developers and managers to pro-

tect their systems better.

If the Federal Computer Systems Protection Act were already in force, the legal discussion would be much (Continued on Page 15)



WHY YOU SHOULD RECOMMEND A KAYPRO EVEN IF YOU DIDN'T BUY ONE YOURSELF

If you're happy with the computer you now own, we're happy for you. Because we both know what you went through to buy it.

More than likely, it was a long year's education that sent you into a complex maze of trial and error. You spent a lot of time asking questions in computer stores. More time hunting for answers in computer books. Even more time investigating all the hardware, let alone software options you had to consider.

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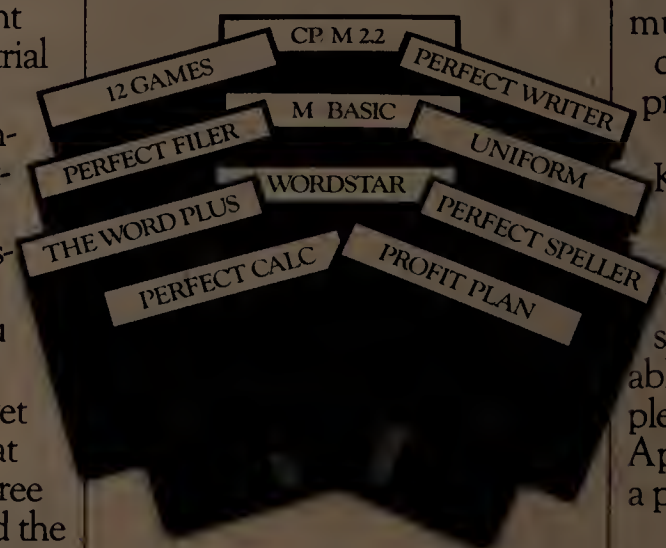
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approach to making and selling our Kaypro II. Rather than a starter system, with options you buy piece for piece, it's designed with all the integrated hardware and software it needs to be fully functional.

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Since we don't consider a monitor, disk drives, interfaces or

other hardware as optional extras, all Kaypro's hardware comes complete in an integrated system. Except, of course, for a printer. As you know, some people don't need one. And those who do must decide whether they need dot matrix or letter quality printing.

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In other words, all the hardware you'd recommend to a first-time buyer. In one complete package.

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After Years of Legislative Slumber

DP Crime Bill Gets Liberal Support

WASHINGTON, D.C. — Until recently, the proposed federal computer crime bill has slumbered for a half-dozen years in the legislative backwaters of Capitol Hill, bereft of congressional support and with no discernible public constituency. All that is changing now, as case after case of youthful computer hackers has been splashed

across the front pages of newspapers and the covers of magazines.

Backers of the federal computer crime legislation in the House and Senate, who previously had their hands full just trying to keep the bill alive, are now receiving unsolicited support and requests for information.

Rep. Bill Nelson (D-Fla.),

sponsor of the latest version of the bill — The Federal Computer Systems Protection Act of 1983 — persuaded a House subcommittee to hold hearings on the bill last fall.

But after the panel took testimony from public and government witnesses who primarily argued the subject needs further study, the mat-

ter disappeared from sight once more.

Now, Nelson is confidently expecting further hearings on his legislation. In an Aug. 25 letter, Rep. Don Edwards (D-Calif.), chairman of the House Judiciary Subcommittee on Civil and Constitutional Rights, which has jurisdiction over the bill, told Nelson, "I am firmly com-



mitted to holding those hearings, and I am optimistic that they will take place this fall."

The publicity surrounding the recent string of computer hacking incidents "has helped us tremendously," remarked Stephanie Sears, a Nelson staff assistant.

"We're just delighted," she said, adding that "as soon as the hearing is over, we're going to try to push [the bill]."

A companion bill was recently introduced in the Senate by Sen. Paul Trible Jr. (R-Va.), whose legislative assistant Rachel Flick said, "We've been very gratified with the [recent] attention" the hacking cases have focused on the bill.

Noting the Senate bill was introduced too recently to have received any legislative action, Flick said Trible's staff plans to meet with the relevant Senate subcommittee soon after Congress returns this week from its Labor Day recess.

DP Hackers Snatching Attention

(Continued from Page 14) more straightforward in that it would outlaw the activities of these and other hackers. The bill would provide penalties for "whoever uses, or attempts to use, a computer ... [that] operates in or uses a facility of interstate commerce."

Telephone System Qualifies

An aide to Rep. Bill Nelson (D-Fla.), the House sponsor of the bill, said the national telephone system, used by the hackers to gain access to systems across the country, qualifies as a facility of interstate commerce.

While the law would be subject to court interpretation, the aide added that the recently publicized hacking is one of the activities at which the bill was aimed.

If enacted, those convicted of hacking activities under the federal statute would be liable for fines up to \$50,000 and up to five years in jail. The bill, if passed, would not automatically bring these activities under federal jurisdiction; they could still be prosecuted locally under existing state laws, but the federal law would be available if needed.

But it too comes complete with a Kaypro.

And with its CP/M operating system, Kaypro II is capable of running thousands of other business programs, to fill more specialized needs.

IT SELLS FOR \$1595, COMPLETE.

People are bound to ask you how much they should spend on a computer. There is, of course, an obvious answer: as little as possible and still get a serious business system, complete with all the functions they need.

At \$1595, Kaypro II is the least expensive serious business system we know of on the market today.

There are basic starter systems advertised for less. But their optional hardware and software can double or triple their basic price. So they can end up costing \$2000-\$3000 more than a Kaypro.

A good example is an Apple IIe. With a hardware configuration comparable to Kaypro II's, complete with comparable software, it lists for an average price of \$4400. \$2805 more than a Kaypro.

IT OFFERS MORE MEMORY FOR THE MONEY

Since disk drive memory capacity is always a concern, once again the idea is to get the most for the money. With two disk drives, Kaypro II gives you 400K for \$1595. With equivalent hardware, an IBM gives you 320K for about \$2800. And Apple IIe gives you 286K for about \$2400.

So once again, Kaypro II delivers.

IT HAS POWER TO SPARE FOR WHAT MOST BUSINESSES NEED.

The more you love computers, the more tempting it is to recommend a 16-bit vs. 8-bit

machine. You know that 16-bit systems are a little faster and have more power to run longer programs.

However, 16-biters are far more expensive than the 8-bit variety. And, unfortunately, have only a handful of business applications software packages that really take advantage of them.

SPECIFICATIONS

Microprocessor	Perfect Filer
Z-80	Perfect Calc
Operating System	spreadsheet
CP/M 2.2	Wordstar word processing
User Memory	The Word Plus
64K	Profit Plan
Disk Drives:	spreadsheet
2 drives, 400K, unformatted	M-Basic
Interfaces	12 Games
1 Serial	Uniform—allows computer to
1 Parallel	'read' and 'write'
Keyboard	TRS-80, Osborne, Xerox disks
Detached, 63-key with numeric keypad	Dimensions
Software included:	Height: 8 inches
Perfect Writer	Width: 18 inches
word processing	Depth: 15½ inches
Perfect Speller	Weight: 26 lbs. (portable)

Considering the real needs and budget limitations of most small businesses, why suggest a company limo when a good company car will do?

Since 75% of all micros sold today are 8-bit systems, it's indicative of their capacity to take care of business. We'd stick with a Kaypro II.

IT CAN PAY FOR ITSELF FASTER THAN MORE EXPENSIVE COMPUTERS.

Every business person wants a computer to pay for itself in increased productivity.

And the faster the better. Perhaps on this count alone, Kaypro II is worth recommending.

As a fully functional business system for \$1595, Kaypro can win the payout race hands down.

IT'S BECOME A LEADING SELLER THANKS TO COMPUTER BUFFS, LIKE YOU.

In fact, Kaypro II is one of the best sellers in the \$1000-\$5000 price range. And it got there largely because of the enthusiastic word of mouth, and word of press, of computer enthusiasts. Many of whom, after building their own systems, bought a Kaypro II as their second computer.

So you certainly won't be alone if you recommend Kaypro II to anyone shopping for a first computer.

Or look at it this way. Once you tell people about the complete business computer for \$1595, they'll probably stop bugging you with a lot of questions.

They may even forget to ask why you didn't buy a Kaypro II for yourself.

Just between us buffs, we can't recommend a good answer for that.

CALL 800-447-4700 FOR THE DEALER NEAREST YOU.



T/S Vendors Must Integrate Micros, Survey Warns

By Paul Gillin
CW Staff

MOUNTAIN VIEW, Calif. — Remote computing services vendors who do not take quick and dramatic action to integrate microcomputers will face severe consequences, a report recently released by Input, Inc. warned.

The reason is that users are buying microcomputers for many of the same reasons they once contracted with remote services, according to the report, titled "Personal Computer Opportunities for Remote Computing Services Vendors."

The survey of 50 remote computing services users and eight major vendors found that 48% of the users

Industry Spotlight

spent less for remote computing expenditures during the past year. Of those indicating a decline, the average decrease was 46% of the remote computing budget.

Sixty-two percent of those reporting declines stated that the availability of microcomputers was at the heart of their decisions. All of the users indicated that they intend to increase their use of micros in the next year.

The survey also found that the reasons users buy microcomputers closely parallel the reasons they for-

merly bought remote computing services: low cost, local control and local capability.

Information Analysis

In addition, the most frequent application run on microcomputers was found to be information analysis, an area that was formerly the strong point of remote computing services.

A possible reason why remote computing vendors have failed to respond effectively to this intrusion is a misperception of user needs, the survey indicated.

For example, while users rated provision of vendor maintenance as No. 2 in importance, vendors placed it at No. 12.

Communications Ranked

Users said that communications with remote departments was their third most important need; vendors ranked it seventh. And communications within departments was ranked fourth by users, 11th by vendors, according to the survey.

"The [personal computer] assault on traditional remote computing ser-

vices offerings will become a major attack during the next few years," the Input report predicted.

Whereas remote computing is judged superior to micros in 20 out of 26 major categories today, that superiority will remain in only 13 categories by 1985 and two categories by 1988, the report said.

Unique Factors

Because of the obvious desirability of the stand-alone solution, remote computing vendors cannot afford to compete with the micro on its own turf, the report maintained. Rather, the successful vendors will emphasize factors that are unique to remote computers.

These include understanding of specific market segments; communications capabilities to link micros together; availability of centralized processors; availability of support, training and consulting; and a wide variety of services that can be provided.

"Developing full-service strategies is vital to long-term success," the report stated.

The report costs \$2,000 from Input, which is located at 1943 Landings Drive, Mountain View, Calif. 94043.

G.E. INFORMATION SERVICES CO.	
Services	Mark III (Honeywell, Inc.-based) Mark 3000 (IBM-based)
Accounting	Yes
Financial Modeling	Yes
Data Base Management	Yes
Statistical Analysis	Yes
Scientific	No
Graphics	Yes
Decision Support	Yes
Manufacturing	Yes
Electronic Mail	Yes
Turnkey Systems	Yes
Hardware	Mark III features 48 Honeywell DPS 8/70 mainframes. Mark 3000 runs three IBM 3081s under MVS.
Network	Mark III service is available by local telephone in over 750 cities in 24 countries. Terminal transmission speeds of 50 to 300 bit/sec, Telex access, 1,200 bit/sec service and high-speed service of 2,000-, 2,400- and 4,800 bit/sec I/O are available.
Future Directions	General Electric Information Services Co. intends to become a supplier of a full line of computing services. Recently, a market segment has grown up that is analytic single-site oriented. At the other end of the spectrum are the production-oriented, largely multisite applications. The integrated solutions segment will require a high degree of reliability, speed of implementation, customization and interconnection. The packaged segment will be driven by cost, convenience and standardization. The ability to serve both is the goal of the company.

ADP NETWORK SERVICES, INC.	
Services	Autonet (Digital Equipment Corp.-based)
Accounting	Yes
Financial Modeling	Yes
Data Base Management	Yes
Statistical Analysis	Yes
Scientific	No
Graphics	Yes
Decision Support	Yes
Manufacturing	No
Electronic Mail	Yes
Turnkey Systems	Yes
Hardware	ADP has 100 DEC Decsystem-20, 36 Decsystem-10 and two VAX-11 processors, interconnected and configured into more than 30 systems.
Network	ADP/Autonet provides access to an international packet-switched teleprocessing network; the network can be interconnected with Tymshare, Inc.'s Tymnet, Western Union International, Inc.'s Telex, GTE Telenet Communications Corp.'s Telenet, RCA Corp.'s Globecom and ITT's Worldcom; more than 300 communications computers around the world provide access to host processors.
Future Directions	ADP Network Services recently refocused its marketing efforts to provide specialized services through two new business units. Financial Services will concentrate on broadening existing worldwide information systems for banks and brokerage firms in the areas of treasury management, planning products and financial data bases. Corporate Services will expand its current international product base to the automotive and manufacturing industries, value-added resellers, brewing and telecommunications firms and government agencies. The introduction of a line of micro-based delivery systems and an expansion of the ADP/On-Site offerings will further ADP Network Services' established user-site hardware position.

A Note About the Charts

The companies that appear in the charts on these two pages and on Page 18 are the top 10 remote problem-solving vendors, as ranked by International Data Corp., the market research firm based in Framingham, Mass.

In addition, the final chart on Page 18 covers the IBM Information Network, a new player on the remote computing scene.

The categories of application packages represent those that

Computerworld believes are of the greatest interest to business users.

Most vendors offer several packages in each area, as well as industry-specific applications and external data bases.

The information in the charts was gathered from *Timesharing Decisions 1983*, published by Real Decisions Corp. of Stamford, Conn., and from the individual vendors.

CONTROL DATA CORP.	
Services	Cybernet (Control Data Corp.-based) Business Information Services (IBM-based)
Accounting	Yes (Manufacturing Only)
Financial Modeling	Yes
Data Base Management	Yes
Statistical Analysis	Yes
Scientific	Yes
Graphics	Yes
Decision Support	Yes
Manufacturing	Yes
Electronic Mail	No
Turnkey Systems	Yes
Hardware	Cybernet operates more than 20 large-scale Cyber 170 and Cyber 200-series computers in five U.S. data centers. Business Information Services houses multiple large-scale IBM mainframes.
Network	Cybernet Services has local interactive service available in more than 200 cities worldwide. Control Data Business Information Services maintains a private international network which includes 100,000 miles of leased data communications and the use of two satellites. It is available in over 2,500 locations.
Future Directions	CDC will emphasize efforts to link into microcomputers and minicomputers and to provide software that can be integrated into a range of machines. CDC's financial information service offers a program for credit unions in which daily transactions are processed locally and then transmitted to a host computer. Cybernet Services provides Cybernet Connect to link microcomputers to its network. Control Data Software Co. has been established to acquire microcomputer software to further the thrust into microcomputers and minicomputers.

Remote Services Firms in the Throes of Change

(Continued from Page 1)

Observers agree that remote computing is in the throes of changes that will transform the industry almost completely over the next several years. Vendors once focused on providing CPU power; the new shift favors diversification across a broad line of applications and services.

Within the next five years, remote computing companies are expected to establish a much more visible presence in software, communications and consulting markets, particularly in those segments that had previously been served only by small vendors. "Time-sharing vendors are moving toward being information providers rather than processing providers," said Alfred Berkeley, a financial analyst at Alex Brown & Sons in Baltimore.

"The next five years will see an almost total disappearance of the raw computer utility concept," added Ed Metz, senior vice-president at Input,

Industry Spotlight

Inc., a consulting firm.

The shift is already notable in the slowing growth of batch services, once the lifeblood of the industry. U.S. revenues for batch processing have grown at a scant 5% since 1981, according to International Data Corp. (IDC), the Framingham, Mass., market research firm.

Remote problem-solving vendors, or those that supply some applications and access to data bases, have maintained a steady 11% growth rate during that time. However, revenue declines shown by some of the top vendors, including United Information Services, Inc. (UIS) and Comshare, Inc., have foreshadowed trouble in the industry.

In contrast, the market for remote automated transactions — services that address specific markets — has

forged ahead at a 19% annual rate in the U.S. market. The success of vendors like Electronic Data Systems, Shared Medical Systems and National Data Corp., all of which offer specialized services, has led the traditional suppliers of raw processing to seek new avenues.

"There's a lot of scrambling. The vendors know that no matter what market they go into, they have to become leaders and do it quickly, with well-articulated strategies for both

large and small users," Ann Morley, an IDC consultant, said.

Last year saw an unprecedented flurry of acquisition activity in the remote computing services business. There were 138 acquisitions by 113 buyers, including seven of the top 10 vendors of remote problem-solving services, according to IDC.

Remote computing services companies are seeking refuge in both horizontal and vertical markets. Comshare, for example, has indicated that it wants to be a market leader in decision support systems, while Informatics General, Inc. seeks to es-

(Continued on Page 18)

TYMSHARE, INC.	
Services	Tymcom-IX (Xerox Data Systems-based) Tymcom-X (Digital Equipment Corp.-based) Tymcom-370 (IBM-based)
Accounting	Yes
Financial Modeling	Yes
Data Base Management	Yes
Statistical Analysis	No
Scientific	No
Graphics	Yes
Decision Support	Yes
Manufacturing	Yes
Electronic Mail	Yes
Turnkey Systems	Yes
Hardware	Tymcom-370 employs six IBM 370/158 mainframes under the VM operating system, three IBM 3033s under VM and one Amdahl Corp. 470V/6 under IBM's MVS; Tymcom-X runs 10 DEC PDP-10 KI, 17 PDP-10 KL and 10 Decsystem-2020 mainframes; Tymcom-IX runs over 20 Xerox Data Systems 940s.
Network	Tymnet, a wholly owned subsidiary of Tymshare, provides highly enhanced communications between a variety of terminals and computers. Tymnet has more than 1,000 intelligent network nodes or communications processors and provides local access from more than 425 U.S. cities and 40 foreign countries.
Future Directions	Tymshare is moving toward integration of advanced data communications technology with powerful computer and software resources to solve information management problems. This includes electronic interchange of information and the automatic, often remote, processing of data into useful information for Fortune 1,000 companies, financial institutions, utility firms and government.

DUN & BRADSTREET COMPUTER SERVICES, INC. (Formerly National CSS)	
Services	IBM and Amdahl Corp.-based
Accounting	Yes
Financial Modeling	Yes
Data Base Management	Yes
Statistical Analysis	Yes
Scientific	No
Graphics	Yes
Decision Support	Yes
Manufacturing	No
Electronic Mail	No
Turnkey Systems	No
Hardware	Dun & Bradstreet runs one IBM 3081, one IBM 3033, one Amdahl 470V/8 and one Amdahl 470V/6.
Network	Approximately 120,000 land miles of telecommunications lines make up the domestic network. Local dialing is provided in over 140 cities. Low-speed terminals are supported at speeds from 110 through 1,200 bit/sec. Synchronous dial service is supported at 2,000-, 2,400-, 4,800- and leased line service up to 9,600 bit/sec.
Future Directions	Information not available

COMPUTER SCIENCES CORP.	
Services	CSVs/CMS (IBM-based) CSVs/TSO (IBM-based) CSTS (Sperry Corp.-based)
Accounting	Yes
Financial Modeling	Yes
Data Base Management	Yes
Statistical Analysis	Yes
Scientific	No
Graphics	Yes
Decision Support	Yes
Manufacturing	No
Electronic Mail	Yes
Turnkey Systems	Yes
Hardware	CSVs/CMS and CSVs/TSO each run on an IBM 4341 and 3083 under IBM's VM/MVS operating system; CSTS employs five Sperry 1100/80 (2 by 2) and three Sperry 1100/80 (1 by 1) under Sperry's CSTS II operating system, one Sperry 1108 under Sperry's CSTS and one IBM 4341-2 under IBM's VM/MVS/CMS operating system.
Network	Computer Sciences' Infonet network provides both bisynchronous and asynchronous disciplines. Bisynchronous support is provided for IBM 2780/3780 terminals at speeds of up to 4,800 bit/sec dial-up. Speeds of up to 9,600 bit/sec are supported on a dedicated line.
Future Directions	Computer Sciences intends to be a single-source systems integrator, handling procurement, administration and coordination between products from a variety of vendors. The company is moving toward a policy it calls "knowledge transfer," which involves offering integrated hardware, software and processing solutions to problems.

UNITED INFORMATION SERVICES (UIS)	
Services	Apex (Control Data Corp.-based) Supra (Cray Research, Inc.-based) DEC-10 (Digital Equipment Corp.-based) Centra (IBM-based)
Accounting	No
Financial Modeling	Yes
Data Base Management	Yes
Statistical Analysis	Yes
Scientific	Yes
Graphics	Yes
Decision Support	Yes
Manufacturing	No
Electronic Mail	Yes
Turnkey Systems	No
Hardware	Apex incorporates multiple CDC Cyber computers and a Cray Research Cray-1S under Cray's OS operating system. The DEC-10 service runs on more than 20 Decsystem-10 mainframes. Supra service is based upon a Cray Research Cray-1 Model S/2000. Centra service utilizes twin IBM 3083 mainframes under IBM's VM and MVS operating systems
Network	UIS' Uninet service consists of more than 81,000 miles of leased communications lines and more than 250 network nodes. Interactive transmission speeds of 110-, 150-, 300- and 1,200 bit/sec are available. Remote batch speeds of 2,000-, 2,400-, 4,800-, 9,600- and 19.2K bit/sec are offered.
Future Directions	As capabilities in software design, communications, support and training have become crucial to users, UIS no longer considers processing services its most valuable offering. UIS has recently announced plans to integrate microcomputer technology into its existing offerings. Communications offerings will be expanded as will the company's library of third-party and proprietary software. The company will also concentrate on building its professional services including consulting, application analysis and design, custom/contract programming and maintenance.

T/S Companies to Enter Software, Consulting,

(Continued from Page 17)

establish dominance supplying software for the legal profession. ADP Network Services, Inc. has announced plans to extend products into the automotive, manufacturing, brewing and telecommunications industries, while Control Data Corp. will offer a specialized program for

Industry Spotlight

credit unions.

If "vanilla time-sharing" is dead, as most observers acknowledge, then the future of time-sharing will be built upon strengths that are inher-

ent in its unique business. Among these are skill in integrating diverse applications, the provision of sophisticated communications capabilities and the capability to support large external data bases.

Most observers agree that remote computing is evolving into an industry in which mainframes will act as repositories of information and communications controllers to support a network for the expanding ranks of micro users. "The shift of the remote computing services vendors should be to provide data to the box and let the user do his own computation," said Warren Pyles, senior vice-president and general manager for financial services at ADP Network Services. "Remote computer services will essentially be a storage device and an interface to external data bases."

Vendors are notably trying to smooth over the traditional adversary relationship between themselves and in-house DP departments. Whereas remote computing vendors once targeted the end-user commu-

nity, the new emphasis is on "trying to complement the in-house hardware," according to Len Bergstrom, director of client services at Real Decisions Corp. in Stamford, Conn.

"Time-sharing has traditionally been the enemy of DP," Bergstrom noted, "but the movement among time-sharing vendors lately has mirrored the movement of mainframe vendors."

One apparent shift has been the establishment by several remote computing services companies of IBM-based services, particularly those centered around IBM's end-user-oriented CMS systems software. Computer Sciences Corp., which for years relied on Sperry Corp. hardware, now offers both MVS/TSO and VM/CMS on IBM systems. GE Information Services Co. (Geisco) has expanded from its traditional Honeywell, Inc.-based service into the TSO market.

Other moves to IBM hardware have recently been made by Comshare and Dun & Bradstreet Computer Services, Inc. The most recent vendor to join the IBM crowd is UIS, which last month announced its IBM-based Centra service "to extend the in-house DP professional's abili-

BOEING COMPUTER SERVICES CO. (BCS)	
Services	Mainstream CTS (IBM-based) Mainstream EKS (Control Data Corp.-based) Mainstream VST (Cray Research, Inc.-based) Mainstream TSO (IBM-based)
Accounting	No
Financial Modeling	Yes
Data Base Management	Yes
Statistical Analysis	Yes
Scientific	Yes
Graphics	Yes
Decision Support	Yes
Manufacturing	Yes
Electronic Mail	No
Turnkey Systems	Yes
Hardware	Boeing's Mainstream CTS service consists of IBM 3033s and 3081s running an enhanced version of IBM's VM operating system. The EKS service uses a CDC Cyber 760 under CDC's NOS operating system. The TSO service is based on IBM 3033 mainframes under IBM's MVS operating system. Mainstream VST uses a two-million word Cray Research Cray-1 supercomputer under Cray's COS operating system.
Network	The BCS Network provides local telephone access in most major metropolitan areas of the U.S. and in many parts of Canada and Great Britain. Communication speeds of 10-, 15-, 30- and 120 char./sec and 2,000-, 2,400- and 4,800 bit/sec are supported. Special arrangements can be made to accommodate speeds of 7,200 and 9,600 bit/sec.
Future Directions	Boeing plans to respond to the pressures that new technologies such as microcomputers have placed on the traditional remote computing services marketplace. Boeing plans to pursue markets in several areas: office systems integration, proprietary software products, network services, integrated systems, remote computing services processing and training (including computer-based instruction) and professional services.

COMSHARE, INC.	
Services	VM/CMS (IBM-based) Commander II (Xerox Data Systems, Inc.-based) Comshare/CRC (Amdahl Corp.-based)
Accounting	No
Financial Modeling	Yes
Data Base Management	Yes
Statistical Analysis	Yes
Scientific	No
Graphics	Yes
Decision Support	Yes
Manufacturing	No
Electronic Mail	No
Turnkey Systems	Yes
Hardware	VM/CMS runs one IBM 4300 under IBM's VM/CMS operating system; Comshare/CRC service is available on two Amdahl Corp. 470V/8 systems under IBM's MVS/TSO operating system; Commander II service on 44 Xerox Sigma 9 computers and an IBM 4341.
Network	Telegid is Comshare's proprietary network. GTE Telenet Communications Corp.'s Telenet service is also available. The service is available in 320 cities worldwide. Service ranges from 110 bit/sec to 1,200 bit/sec, and IBM 3270 support is available.
Future Directions	Comshare looks to be an international decision support software and services firm, offering in-house mainframe software, microcomputer software, remote computing services and professional services. Its strategy will be built around System W, its multidimensional decision support system. Comshare will continue to develop interactive software for in-house information center use on IBM and compatible mainframes. It will also continue to add to its microcomputer software product lines and to link microcomputer software on IBM Personal Computers to mainframe software. On its time-sharing service, Comshare will offer data management, financial modeling and DSS products. A Professional Services Division will provide consulting and support to users of IBM mainframes.

CHASE ECONOMETRICS/INTERACTIVE DATA CORP. (CE/IDC)	
Services	Not Applicable
Accounting	Yes
Financial Modeling	Yes
Data Base Management	Yes
Statistical Analysis	Yes
Scientific	No
Graphics	Yes
Decision Support	Yes
Manufacturing	No
Electronic Mail	No
Turnkey Systems	Yes
Hardware	CE/IDC uses three Amdahl Corp. 470V/8s, one IBM 4341 Group 1 and one IBM 370/138, plus varied minicomputers around the country. The systems run under a proprietary operating system similar to IBM's VM.
Network	Thirty U.S. locations and 15 international locations. Multiple Comten, Inc. 3650 units linked via 9,600 bit/sec lines. Local dial-up access available. Line speed support of 10-, 15- and 30 char./sec and 1,200-, 2,000-, 2,400- and 4,800 bit/sec.
Future Directions	The major shift in investment is toward beefing up the basic technology to take advantage of microcomputers. Services will continue to be much the same as always, but they may be delivered through microcomputers. CE/IDC regards micros as a giant opportunity. Using its large economic and financial data bases, the company has a vehicle it will use to continue building decision support services. The company's data, communications network and consulting experience will be brought to bear in focusing on this new market.

IBM INFORMATION NETWORK	
Services	Not Applicable
Accounting	No
Financial Modeling	Yes
Data Base Management	Yes
Statistical Analysis	Yes
Scientific	Yes
Graphics	Yes
Decision Support	Yes
Manufacturing	No
Electronic Mail	Yes
Turnkey Systems	Yes
Hardware	Information not available
Network	IBM's information network includes 10 high-speed nodes and 250 start/stop points available in most major cities.
Future Directions	Not available

Communications Markets in Next Five Years

ty to address user needs," according to a spokesman.

The moves are clearly intended to reposition remote computing as an adjunct to corporate data centers. Meanwhile, the companies will compete more aggressively with the software vendors whose products they had previously offered.

In line with that, service vendors are becoming more active in the applications software market, a shift that has been taking place for several years. The market has been particularly attractive for the service firms because they can offer a convenient and low-risk way for users to evaluate and install software without shutting down operations.

"People now will not use a package unless it can be brought in-house," Bergstrom said. "Time-sharing is the best test bed that has ever existed for new applications."

"Remote computing services companies are seeing that their users are wanting to acquire software rather than services," added Ron Koval, vice-president of sales and marketing for Boeing Computer Services

Federal Agencies Gain Authority In DP Purchases

WASHINGTON, D.C. — The General Services Administration (GSA) has significantly increased the authority of federal agencies to procure computers and teleprocessing services without prior GSA review.

The action, announced late last month, gives agency officials authority to purchase computers with prices up to \$2.5 million and teleprocessing services up to \$2 million annually. The old ceilings, above which procurements required approval from GSA, the government's central purchasing agency, were \$500,000 and \$300,000, respectively.

GSA Assistant Administrator Frank Carr, head of the agency's Office of Information Resources Management, said the move is in line with the government's trend toward decentralization of information processing acquisitions and will reduce paperwork and speed delivery of computers and related equipment and services.

The action follows improvement during the last several years in agency compliance with federal procurement regulations, he added. The reduced number of GSA reviews needed for these procurements will permit the agency to concentrate on the more expensive and critical procurements, he said.

"Of course," Carr said in a statement issued by his office, "GSA will retain its oversight function, and if an individual agency is not performing satisfactorily under these more liberal authorities, we will recall the delegations [of authority]."

GSA said the revised procurement thresholds will reduce by more than one half the number of procurements GSA needs to review, but the total dollar amount of purchases reviewed by the agency will be about 10% less than at current levels.

Industry Spotlight

Co. Boeing will soon create a division to develop and market software products. "In five years, we see ourselves as a major supplier of software," Koval said.

Packaged software is also seen as a potential solution to problems at UIS, a major supplier of raw computing power, which suffered a 15% decline in revenues in 1982. "In five years, we will be getting at least two times as much revenue from software packages, and it could make up more than 50% [of our revenues at that time]," John Kost, vice-president of marketing at UIS, said.

Another area of high activity has been in value-added communications networks, a market dominated by Tymshare, Inc.'s Tymnet and GTE Telenet Communications Corp.'s Telenet. Since July, Geisco and Computer Sciences have announced competing value-added networks.

"We will have a lot of landlocked [IBM Personal Computers] out there, and remote computer services are ideal for connecting them," said Alysa Subtelny, a senior analyst at The Yankee Group, a Boston consulting firm.

Different industries are taking the

initiative in establishing their own communications standards and using remote computing as a convenient network facility, Subtelny said. "Eventually, you'll see interconnection of all these independent networks."

Networking capability could even provide a central resource for micro users to obtain new software, ADP Network Services' Pyles added. "The user will merely call up his remote computing services firm on his personal computer and download the latest version of the package and be billed a one-time charge," he said. The remote computing services vendor could even provide support for micro software that is not otherwise available, he said.

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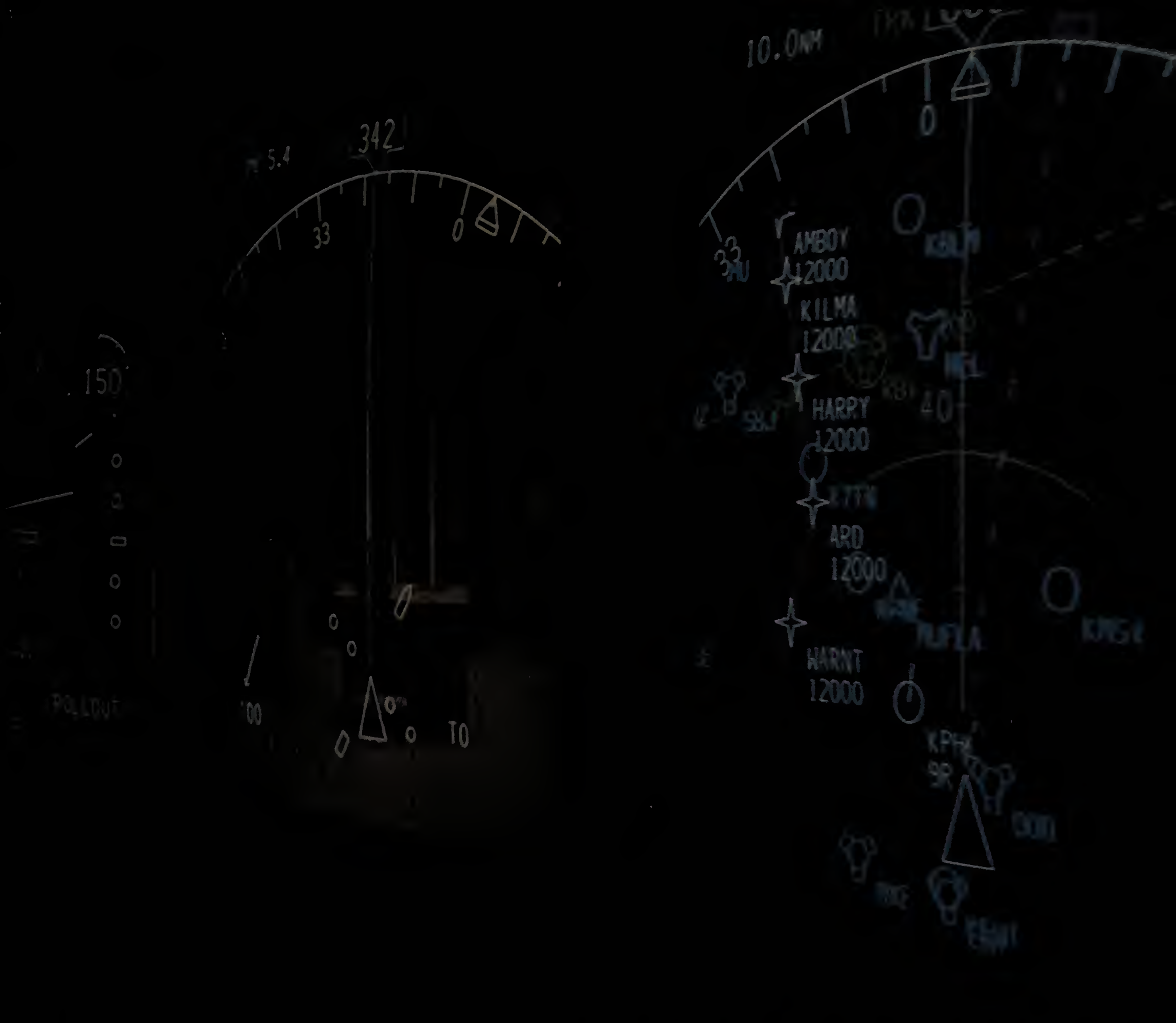
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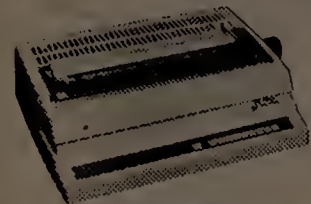
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NAPLPS Standard Acceptance Coming Soon, Says Ansi X3 Exec

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. —

Final U.S. approval of a North American videotex display standard is likely by the end of next month.

That word came recently from Tom Hastings, who chairs the American National Standards Institute (Ansi) group which has been devel-

oping the standard in collaboration with Canada.

A proposed final version of the standard was completed several months ago. When it was sent to interested parties, however, they suggested so many changes that the resulting revised version of the proposed standard was also circulated.

Comments generated by

the second ballot were received late last month, and Hastings said they proposed editorial changes rather than any substantive changes. He expects the editorial changes to be made this week.

Ansi's X3 committee and its Board of Standards Review will then vote on the document. If they approve it, which is considered likely, the standard will be adopted. Hastings expects this process to take about six weeks.

The pending standard is the North American Presentation Level Protocol Syntax (NAPLPS). It defines the format, semantics and syntax of the codes needed to create graphics displays on a videotex user's TV screen. The codes are transmitted in response to the user's query from a computerized videotex data base — typically over a conventional telephone circuit or CATV channel.

The proposed NAPLPS standard will be submitted to the Consultative Committee on International Telephone and Telegraph (CCITT), which develops standards used by telephone networks throughout the world, as well as Ansi. CCITT's Study Group VIII is in charge of developing videotex standards. NAPLPS is one of three regional standards likely to be adopted next year by CCITT. The second was developed by European telecommunications administrations and is known as the Conference of European Postal/Telecommunications Administrations standard, while the third is Japan's Captain system.

Through an "experts group" composed of technicians from the U.S., Canada, Japan and several European countries, CCITT is sponsoring development of a scheme that will permit users of one system to communicate with data bases employing either of the other two formats. This work is reportedly in a preliminary stage.

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Unique Characteristics Can Influence Decision Report Discusses Factors in On-Line Auditing

By Katherine Hafner
CW Staff

NEW YORK — Auditing in an on-line environment does not change the types of errors and irregularities that a certified public accountant (CPA) can encounter. But there are some unique characteristics in an on-line environment that can influence an auditor's decisions when designing and performing audit procedures.

This is the conclusion of a recent Guidelines Series report from the American Institute of Certified Public Accountants (Aicpa).

The report, entitled "Audit and Control Considerations in an On-Line Environment," pointed out that while on-line processing is prone to the same mistakes as batch or manual processing, there are certain factors to consider when auditing on-line:

- Changes in the likelihood of occurrence of certain types of errors or irregularities.

- Changes in the nature and extent of controls.

- Changes in the nature of the audit trail and the sources of audit evidence.

"The increasing importance of on-line processing made us take a closer look at it," commented James David, a partner at the accounting firm of Ernst & Whinney and chairman of the institute's DP Auditing Standards Subcommittee. "The likelihood of an auditor encountering [on-line procedures] has significantly increased.

"Many of the audit procedures employed by CPAs would not change in an on-line environment, while some others would because of the change in the likelihood or regularity of errors," David commented.

On-line controls, for example, may be similar to or substantially different from those typically used for other types of data processing, according to the report. If an on-line system replaces a batch system, certain control procedures may remain the same, or different control procedures may be used to achieve the same control objectives.

"If a type of control is not used, the absence may be justified because related risks have been reduced," the report noted. "However, it is

possible that significant risks still exist and that related controls should have been included in the design of the new on-line system but were not."

On-line auditing carries with it certain advantages, David said, such as access to data files and the reduction of risks that can be found in manual and even batch pro-

cedures.

But circumstances that increase the risk of certain errors include:

- Uncontrolled remote terminals providing unauthorized modification of transactions or balances already in computer data bases.

- Unauthorized terminals providing unauthorized ac-

cess to data and programs.

- A greater initial likelihood of accidental input and processing errors due to lack of familiarity among DP personnel with control procedures unique to on-line processing.

"What we try to point out [in the study] are those areas where the likelihood has gotten higher and those

where the likelihood has decreased," David commented. "But essentially, the auditor's objective would remain the same and the difference is mainly a technicality."

The report (Guideline Series M047581) is available for \$8.50 from Aicpa, Order Department, 1211 Ave. of the Americas, New York, N.Y. 10036.

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International Report

FROM THE CW INTERNATIONAL NEWS NETWORK

AUSTRALIA

MELBOURNE — The Australian Bank Employees Union's State Bank Division has directed its members not to assist in installing or implementing any new video display terminals (VDT) until the State Bank of Victoria agrees to comply with the union's policy on screen-based equipment. The policy calls for ergonomic assessment of VDTs and their associated tables and chairs.

MELBOURNE — Control Data Australia Pty. Ltd. has established a joint venture with Integrated Software Solutions Pty. Ltd. Called Business Solutions Software, it will con-

sist of a research and development and software marketing group. The joint venture is believed to be the first in a series of moves into the Australian software market by Control Data.

CANBERRA — The Australian government is considering introducing tax incentives to boost venture capital investments in high technology. Investors in private venture capital companies may be able to write off as much as 100% of their investments against their taxes.

SYDNEY — The economic recession here resulted in a marked downturn in DP staff turnover and also

caused DP pay increases to drop below consumer price index percentage bases, according to a recent survey by Cullen Egan Dell Australia Pty. Ltd. The survey predicted that salary raises for DP staff are likely to continue to fall rather than rise over the next fiscal year.

BRAZIL

SAO PAULO — Foreign microelectronics vendors are worried about the amount of control being exercised by the Central Bank of Brazil here. Importers are currently fighting two major obstacles: bureaucratic barriers imposed by the government and difficulty in obtaining

bank credit, said Celio Ikeda, spokesman for the Brazilian Association of Electric and Electronic Industry. It was reported that many American vendors have recently suspended their imports to Brazil.

RIO DE JANEIRO — The Brazilian Association of Computers and Peripherals (Abicomp), in conjunction with Embratel, a Brazilian telecommunications company, held a special congress to discuss the standardization of the protocol converters that will be used for the Package Computing National Network (Renpac). The Congress, which was broadcast via Embratel's executive television system to Sao Paulo, Porto Alegre, Belo Horizonte and Brasilia, recommended a task force to study the implementation of these conversions.

FRANCE

PARIS — For a few days this month, Paris will be the capital of the DP industry, hosting two major events. The International Federation for Information Processing (Ifip) conference, held every three years, will take place Sept. 19-23, and the Salon International D'Informatique, Telematique, Communication, Organization de Bureautique (Sicob) will be held Sept. 21-30. More than 3,000 participants from around the world are expected to attend.

PARIS — Micromos has introduced a microcomputer based on Intel Corp.'s IAPX 186 microprocessor. Called Toutatis, the machine reportedly operates at a frequency of 8 MHz, four times faster than Micromos' Microcomputer 5, which is based on the Intel 8086 microprocessor. The Toutatis runs under both Microsoft, Inc.'s MS-DOS 2.0 operating system and under Digital Research, Inc.'s CP/M 86. A typical configuration priced at \$2,500 consists of 256K bytes of random-access memory, 256K bytes display memory, one parallel port, two floppy disk drives and MS-DOS.

PARIS — CII-Honeywell Bull, ICL, and Siemens AG have officially announced the creation of a joint research center that will be based in southern Germany. Expected to employ approximately 50 people in 1984, the center will be dedicated to precompetitive technologies.

ITALY

IVREA — Carlo DeBenedetti, Olivetti OPE's former managing director and vice-chairman, has been promoted to chairman and chief executive officer of the company. He succeeds Bruno Visentini, who resigned as chief executive officer after being appointed Secretary of Finance. Olivetti reported an 18% increase over 1982 revenues and a 15% growth in orders.

JAPAN

TOKYO — Uchida Yoko Co. Ltd. has unveiled a computer-aided design system, the Assist 200, that is based on Seiko Instruments, Inc.'s 16-bit Model 9500 scientific engi-

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FROM THE CW INTERNATIONAL NEWS NETWORK

neering personal computer. Priced at \$18,000 for the basic configuration, the Assist 200 is reportedly aimed at small businesses as well as drafting departments in larger businesses.

TOKYO — Mitsubishi Electronic Corp. has unveiled a television set/printer and a stand-alone printer, both of which turn images on conventional television screens into hard copy. Images on the 21-in. TV screen are converted into digital information and printed on thermal-sensitive paper; the television/printer costs about \$1,032 and will be available in October. The printer, which is priced at \$279 and will be available in December, operates at 15 sec/page and can be connected to video cameras and personal computers. The products are expected to be used with videotex and teletext services.

OSAKA — Sharp Corp. has unveiled a 16-bit personal computer featuring multiple windows, a mouse interface and a bit-mapped graphics display. The MZ-5500 is based on the Intel Corp. 8086 microprocessor, has 128K bytes of random-access memory, Digital Research, Inc.'s CP/M 86 and Microsoft, Inc.'s MS-DOS operating systems, Japanese word processing and color display capabilities. The system is priced from \$990.

TOKYO — Epson Corp. has introduced a color CRT to function with the NEC Corp. personal computer series, Fujitsu Ltd.'s FM series, Sharp Corp.'s MZ machines and Epson's own QC-10. It features a 640 by 640 dot matrix and eight colors and costs \$675.

TOKYO — Hitachi Ltd. has announced the Hitachi Office Information Processing System (Hiofis) concept, an office automation system intended to handle a variety of numerical data, documents and graphics tasks. The first Hiofis product is the T-560/20, a multitasking workstation that has personal computer capability; it will be available next June for \$1,400. Also being developed is an optical disk with a 1.3G-byte storage capacity on each side; a Kanji-character printer; and facsimile and related software, Hitachi said.

SWITZERLAND

ZURICH — Winter Partners, a company that specializes in banking applications software, and Swiss Infodata have announced the joint development of a banking system that

runs on microcomputers. Based on Infodata's Real-Time Integrated Banking System (Ribs) and on Digital Equipment Corp.'s multiuser microcomputers, the product is called Micro-Ribs. It was developed for small banking companies and financial enterprises, as well as branch applications and word processing. It can also perform as a subsystem in a computer network configuration.

WEST GERMANY

WILHELMSHAVEN — The Cooperative Wholesale Society of European Retailers for Entertainment Electronics and Home Technology (Interfunk) has entered the personal

computer software marketplace. ISE-ADV/Orga Software GmbH, the German distributor of Cullinet Software, Inc.'s products, is reportedly providing both counselors and training to Interfunk to establish price structures and to decide which software systems are to be marketed in West Germany.

BERLIN — The postal, telephone and telegraph (PTT) administration will offer videotex services to its customers Sept. 15, Secretary of State Dr. Christian Schwarz-Scilling announced at the opening of the Radio and TV Exhibition here. PTT users will be charged regular telephone fees for access time.

BONN — Federal Chancellor Helmut Kohl announced his support of West Germany's high-technology industry in response to a recent series of proposals from that community. During a conference held here by the Ministry of Research and Technology, and 17 high-technology companies, a plan was established to make the German computer industry more competitive in the worldwide marketplace. The members of the group, including Siemens AG, Nixdorf Computer AG, Triumph Adler, AEG-Telefunken and Philips Information Systems, Inc., asked for more concentrated government efforts, such as those found in the U.S., Japan and Great Britain.

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Firm Maps Out Plans to Build Geographic Data Base of U.S.

By Peter Bartolik

CW Staff

LYME, N.H. — A small company located in this rural community has a large goal. It wants to be the Rand McNally of the computer age.

Geographic Data Technology, Inc., with a staff of about 20, wants to establish the geographic data base of the U.S.

The company was established 3½ years ago and since then has been translating to digital form street maps of populated areas. Donald F. Cooke, company founder and president, said recently that within a year or so, the company will have compiled a data base of geographic information covering at least all the major metropolitan areas.

"By that, I mean I don't know if we're going to get around to doing Lyme, N.H., for a while," he explained. "But we will have captured 80% of the [U.S.] population down to the street level within the next couple of years."

Cooke was with the U.S. Bureau of the Census' research center in New Haven, Conn., in 1967 where he helped develop map encoding. He left the bureau in 1968 and founded Urban Data Processing in Burlington, Mass., using similar technology to provide mar-

keting information to banks and the like. That company was sold, and he founded Geographic Data Technology with the goal of "extending digital coverage from where the census bureau left off"; the bureau's 1980 program compiled digital map information for major downtown areas. Cooke said he is about halfway toward his goal.

Provided Boundary Info

For the 1980 census, Cooke's company provided the census bureau with digitalized boundary information of Boston's 150 census tracts. "We may end up being the major [census bureau] supplier for 1990," he predicted.

Geographic Data Technology uses a 16-bit Data General Corp. Eclipse S-140 mini-computer with two tape drives, three Winchester disk units and 768K bytes of memory. Maps are input using Lear Siegler, Inc. ADM-3a terminals equipped with Digital Engineering, Inc. Retro-Graphics terminal enhancement boards. Lear Siegler ADM-5 terminals are also used for inputting street and address number information.

Noncopyrighted single-line street maps are input into the data base, with a digitizer recording every intersection, dead end and major

curve. Census bureau three-digit city block numbers are entered, along with street names, zip codes and the numbers of adjoining city blocks.

Geographic Data Technology always produces software in-house. Cooke said he has examined turnkey systems, but most offer more than he can use. "We've always optimized software for what we actually need," he said.

Once entered and proof-read, information can be provided on magnetic tape, and soon on floppy disk, for specific geographic areas. The range of applications is expansive, Cooke said. The metropolitan government of Washington, D.C., purchased information that will be used to display housing data and demographics by block, but Cooke thinks the greatest application will be in market research for targeting particular groups of people.

Other possible applications include establishing sales territories, routing service calls and deliveries and even providing map displays in rental cars.

As the company figuratively grows across the country, Cooke believes he will need to expand his work force to about 30 people. He is already planning to link the data base to a Zenith Data Systems Corp. Z-100 micro-computer and expects he will need to expand his on-line memory.

"We've got about a billion-byte data base, and about one-fifth is on-line at any one time," he explained. "That's fine when you're spending about 10 days entering new information on Boston, but in two to three years, when we've got the whole country [entered] and we're just adding new streets, we'll probably only need to spend about 20 minutes updating the data. We'll probably need a billion or two bytes of memory and probably go to a bigger machine."



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HP 3000, 1000 IUGs to Merge Pending Membership OK

LOS ALTOS, Calif. — The boards of directors of the Hewlett-Packard Co. HP 3000 International Users Group (IUG) and the HP 1000 IUG have agreed to merge into a single nonprofit organization on Jan. 1, 1984, pending approval by the membership of the HP 3000 IUG.

Bill Crow, association manager for both groups, called the move a logical step that would create the economy of scale necessary to improve services. "Ultimately," he said, "we'd like to be a resource for people using any model of HP computer."

The new group would remain independent from HP and would not effect immediate changes in users' publications, conferences or software library.

More information about the proposed merger can be obtained from the IUG at 289 S. San Antonio Road, Los Altos, Calif. 94022.



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At Integral Systems' Users Meet

Users Given a Glimpse of DP Managers' Future

By Robert Batt

CW West Coast Bureau

SAN FRANCISCO — Users will put more pressure than ever before on data processing managers as batch processing gives way to interactive computing in large organizations.

This was the message delivered by Jeffrey Walker, chairman of Walker Interactive Products, Inc., a software firm specializing in financial planning packages, at Integral Systems, Inc.'s Users Conference '83, held here late last month.

Walker, who has worked in the software development field for 17 years, told his audience of several hundred human resource systems specialists that DP will become much more of an educational and service function than it has been.

"Dramatic changes will face many DP departments in the 1980s as interactive solutions make it possible to handle higher volumes of data. In the 1980s, we are going to see batch systems give way to interactive systems performing the same functions," he predicted.

Severe Work Compression

Such a development, Walker said, means that DP centers will be faced with severe "work compression." Data centers will no longer operate around the clock seven days a week; instead, the work will have to get done during the traditional 40-hour week.

"Data centers will need more than three times the computing power they currently have. This will require lots of personal computers and terminals for end users, which will need to be hooked up to central processors. As a result," Walker said, "corporate data centers will grow by leaps and bounds."

Furthermore, DPers will assume more of a coaching role in their organizations, and "data processing will become much more of an internal service organization. With users inputting more of their own data, it places a responsibility on DP professionals to educate users, particularly in identifying and reporting problems."

Walker asserted that while interactive systems are not yet commonplace, they soon will be, and the marketplace will then demand the next level of development. This, he predicted, will come in the form of integrated systems that will have five major characteristics:

- Common human interfaces so that multiple sys-

tems appear as one system to end users.

- Common tools that are applicable to all interactive products.

- Common system architectures.

- Common data bases.

- Integrated transaction processing capabilities so that users do not need to create new files to move data.

By the end of the decade, Walker told his audience, heuristic software packages that can be adapted to individual users will be developed in volume. "Vendors need to address changes in technology, but user requirements are constantly changing, making products obsolete very quickly. The answer is to create applica-

tions that allow users to be producers — that is, to produce the changes they require themselves," he explained.

Users will be able to regulate for themselves the human interfaces of their systems, Walker suggested, and it will be up to software vendors to anticipate what types of users will want to change

their applications.

"While this will require some technological innovations, such as better terminals and more powerful graphics capabilities, the real creative problem that needs to be solved is to develop tools that will allow users to know how to solve the problems themselves," Walker concluded.



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Report Contends DP Training Issues Ground

By Patricia Keefe
CW Staff

FRAMINGHAM, Mass. — Corporations poised for flight into the Information Age may be grounded by two education issues — the training of end users and the equally important training of the management information systems (MIS) staff to prepare for the rapid development of end-user computing, a report recently issued by a market research firm

here said. According to a recent analysis of user spending, data processing sites spent only .5% of their 1982 DP budgets on training, International Data Corp. (IDC) found. Most of that \$350 million went for training of data processing professionals, not end users, according to "End-User Computing," which said that IDC surveyed 204 Fortune 500 companies.

End-User Computing's Success Hinges on Training: IDC Study

FRAMINGHAM, Mass. — The success of end-user computing will be determined by whether knowledge workers can combine their professional skills with an understanding of how their personal computers operate, International Data Corp. (IDC) maintained in a recently issued report titled "End-User Computing." Unless this goal is addressed with appropriate training programs, the promises of end-user computing will go largely unfulfilled, IDC warned. Today, stand-alone personal computing and mainframe-based end-user computing are very critical aspects of the corporation's growing dependence on information systems to aid the day-to-day operations of knowledge workers. But "end users interested in accessing corporate data and expanding beyond the capabili-

ties of their personal computers, as well as large hardware vendors concerned with protecting their installed base, are rapidly forcing a merger" of stand-alone personal computers with mainframe-based end-user computing, IDC said. This will lead to the elimination of dumb terminals and stand-alone personal computers in large firms, predicted the market research firm. Moreover, the importance that end-user processing on personal computers tied to mainframes will play in years to come further fuels the need for effective and efficient training programs to prepare the end user for major work place changes, the report said. Yet a recent IDC survey of Fortune 500 companies found that there are fewer course options

(Continued on Page 30)

Despite a growing recognition of the need for training, expenditures for training are expected to grow only by 10% in 1983.

Over 100 Available

Almost one-fifth of the respondents to the IDC survey indicated that they offer 100 or more courses to the DP staff; the overall average number of courses available is reportedly 95.5. However, Figure 1 shows that only 12.8% of the respondents indicated that more than 100 courses are available to workers who are not members of the DP staff.

The most effective training method, the survey respondents told IDC, is the traditional classroom, although

other methods of training trailed closely (Figure 2). According to the study, computer-aided instruction (CAI) "still has a

Number of Courses	Percent of Total
1-5	18.5
6-10	10.8
11-15	5.1
16-20	4.1
21-25	.5
26-50	2.6
51-100	3.1
Over 100	12.8
Don't Know	7.2
N/A	36.4

Source: IDC

Figure 1: Number of Courses Provided to Non-DP Staff

Audience	None	Medium					N/A*
		Trad. Classroom	Media Class	Self-Paced Text	CAI	Off-Site Courses	
DP Management	8	89	31	8	5	52	10
Staff/Support	9	77	55	21	9	29	10
Systems Analysis/Design	1	83	77	23	8	30	6
Applications Programming	1	62	71	38	8	22	6
Systems Programming	4	54	47	27	9	55	9
Operations	5	52	77	21	18	25	9
Total Mentions	28	397	358	138	57	213	50
Percent of Total Mentions	20	34.3	31.0	11.8	4.9	18.2	4.3

* NA (No Answer) includes don't knows, refusals and respondents unable to quantify training activities by number of courses.

Source: IDC

Figure 2: Most Effective Training Medium by Audience

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Firms Poised for Flight Into Information Age

long way to go in providing effective instruction, although the stronger showing of self-paced texts argues that, with improvements, CAI could offer an effective alternative for training needs that can be met by other than classroom methods."

Traditionally, the study indicates, many white-collar workers have received either vendor-provided or informal word-of-mouth training within the organization. "Unfortunately, such practices could cripple the introduction of massive end-user-oriented MIS," the report maintained.

"The complexities for these newly developed systems require dedicated professional instruction, even when only considering the cost/benefit of training staff vs. informal, unskilled guidance by highly compensated

professionals or managers," according to the IDC report.

Critical Education Needs

However, the internal DP training staff is often so far removed from the philosophy and practice of end-user computing that it is questionable if it will be able to meet the very critical and complex education needs of end-user computing, the study said (see story on Page 28).

Despite this, it is reasonable to suggest that the DP department be chief advocate of end-user training, the study asserted, since other alternatives fall short of the mark. Corporate training groups and organizational development teams are too often removed from the implementation or application of information systems in the end-user environment and from the technological understanding that is an essential requirement of the educator, according to IDC.

IDC suggested that a training group derived of internal and external sources that provides for active involvement by end-user representatives and top management is the most effective method of coordinating the education of end users. Among the issues this group will have to address are the "critical importance" of Help functions on workstations, one-on-one instruction as well as quality control of education.

The Help functions on most termi-

nals today are "counterproductive and alienating" to the end user, IDC claimed. Improvements in software and hardware could result in the Help function, along with CAI, becoming the key to providing operating skills quickly and effectively, eliminating the "very elementary handholding that presently plagues the [training] staff," according to the study from IDC.

One-On-One Instruction

The IDC survey recommended one-on-one instruction for top management-level end users. This helps to provide a strong education for decision-makers with tight time con-

straints who base critical decisions on Visicorp Visicalc-type electronic spreadsheets.

Since these same executives control the destiny of the information system for the entire organization, the inconvenience of the dedicated relationship is far outweighed by the benefits to be gained, the study contended.

IDC also suggested the training staff select specific interested and committed individuals for preliminary test runs of every new system training or seminar program. These individuals will be more likely to provide truthful and constructive feedback, it added.

End-User Computing Seen Shaping MIS Department Training Issues

FRAMINGHAM, Mass. — As end-user computing restructures the white-collar work place, it also is shaping a number of training issues for the management information systems (MIS) department.

Changes in the actual performance of professional activity brought about by microprocessors has greatly increased the need for each professional, manager and executive to expand his understanding of information and decision support systems as they relate to the work place, according to "End-User Computing," a report recently issued by

International Data Corp. (IDC) here. This in turn has had a profound effect upon corporate MIS, which is finding that as processing power falls more and more directly into the hands of end users, the nature of the DP training mission is also undergoing significant change.

Also, "past expectations that increased user friendliness alone would negate the need for considerable training and education [of end users] have proved untrue," according to the report. In a recent IDC survey of Fortune 500 companies, over

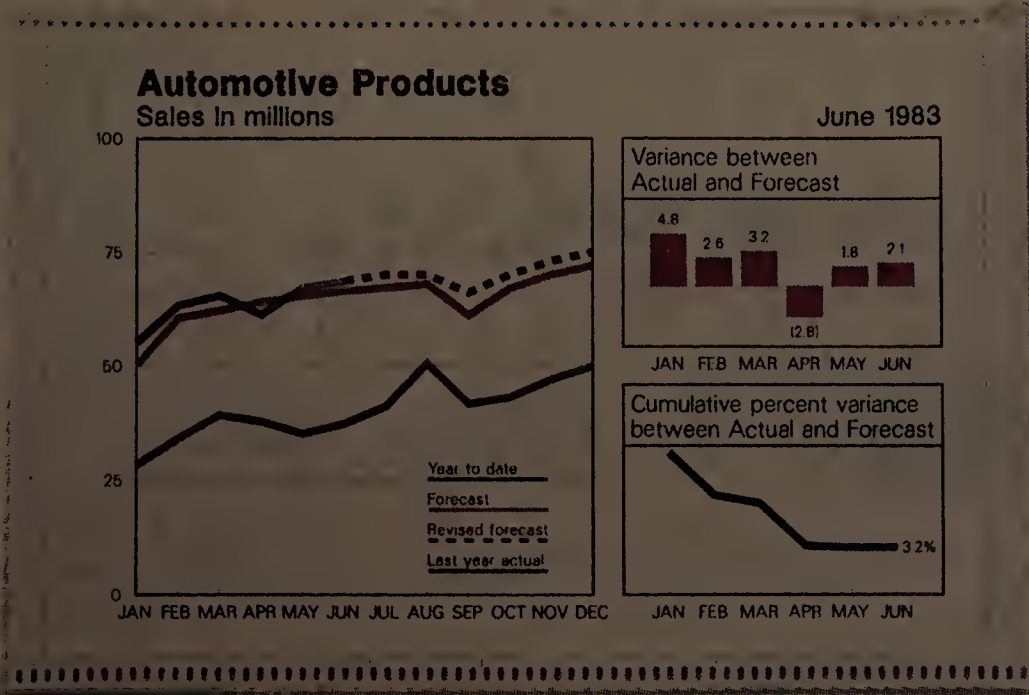
(Continued on Page 30)

Staff Members	Percent of Total
User Groups	36.4
Marketing/	
Technical Support	3.1
Engineering	2.1
Manufacturing	3.1
Client Groups	1.0
Finance	1.5
Open to All Interested Staff	16.4
Top Management	2.1
Don't Know	.5
N/A	33.8

Source: IDC

Figure 3: Non-DP Staff Involved With DP Training Activities

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Training Seen Key to End-User Computing

(Continued from Page 28)

available to the non-DP trainee and limited top management involvement in training.

That survey also found an emphasis on office automation (word processing) implementation and training geared toward support personnel. This is not the best model for training related to end-user computing, according to IDC.

It is necessary to ask not only how job training dollars can be spent most efficiently, but also where those dollars can be spent most effectively. "'How' refers to the media and methods used — computer-based, hands-on, vendor or classroom training, seminars and/or internally or externally developed

courses. 'Where' refers to what functions within the corporation, be they DP professionals or any of a number of white-collar workers," IDC explained.

One approach for developing such a program is the management-supported Professional Development Team. Its charter is to promote the concept that end-user training must integrate an understanding of business dynamics with computer training. To achieve this goal, the team should be composed of representatives of the business and DP functions positioned independently within the corporation to avoid the perception of any bias, IDC said.

Recommendations and courses would be implemented through cor-

porate training, since corporate personnel are being trained. The resulting curriculum would include foundation courses in data processing, particularly addressing the corporate data structures supported by management information systems.

Without a background of solid training, "frustrated end users will find that their executive workstations have turned into very expensive paperweights" instead of saving expensive time and reducing applications backlogs, IDC warned.

Changes in Training Forecast

(Continued from Page 29)

60% acknowledged that training of non-DP staff was a DP training responsibility. Once solely the requirement of DP personnel, more and more training efforts today need to be directed at end users, IDC observed.

Initially, end-user forays into

computing met with little support from the MIS department. Later, systems analysts and programmers interacting with the end-user department inherited the support role. However, the IDC report questioned the instructional skill levels and resources of programmer/analysts, suggesting that in traditional environments, those skill levels are unsatisfactory for knowledge worker education.

Today, IDC is disturbed to find many end users are being trained in unstructured settings. This means end-user training is coming from a variety of sources and often is not the result of a planned approach, but the most convenient solution to the problem.

Must Keep Pace

But as end-user computing grows, the DP staff's understanding and support must keep pace, IDC said. To do this, planning is required, the report warned.

In addition to training end users formally, IDC noted, MIS has to cope with a variety of related issues:

- End-user computing involves a set of hardware and software tools that are almost as new to traditionally trained programmers and analysts as they are to the average end user. These include developing production system extracts for user access, networking personal computers and mainframes and data base administration in a distributed environment.

- Successful support of end-user computing requires a new level of understanding of the business problems that end users are trying to solve. For example, how do the various knowledge workers actually do their jobs?

- DP has not been trained to support the end user, so it retains relationships established for past objectives.

- MIS has had to develop from scratch the facilities to meet the needs of its new clientele, while also holding up the entire computer system of the organization.

In addition, the traditional DP staff trainers are still trying to catch up with the first wave of the end-user computing revolution: the use of fourth-generation and nonprocedural languages on dedicated machines and the rapid proliferation of personal computers.

"The problem is compounded when we consider that DP departments are also responsible for managing and sustaining growing central information systems, which have their own training requirements," according to the study.

In view of these problems, IDC recommended that the education of the DP staff be integrated into an overall corporate plan encompassing both end users and DP staff.

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Managers on the Move

Integrity Financial Group, Inc. of Paramus, N.J., has named GORDON GENEK vice-president of data processing and operations.

Before joining the property/casualty insurance firm, Genek was vice-president of the data processing division of United Jersey Banks in Hackensack, N.J. Prior to that he served as director of McGraw-Hill, Inc.'s corporate data center; director of technical planning for Automatic Data Processing, Inc.; and systems analyst at Prentice-Hall, Inc.

Genek holds an MBA from New York University's Graduate School of Business Administration and a BA in political science from City College of New York.



Gordon Genek



William L. Horrocks

• • • WILLIAM L. HORROCKS has been named director of management information systems at United States Health Care Systems, Inc. in Philadelphia. In this position, he will be responsible for designing and maintaining a centralized information and communications system to provide corporate and subsidiary management with information on a day-to-day basis.

Horrocks was previously director of medical center information systems at the Milton S. Hershey Medical Center of the Pennsylvania State University in Hershey, Pa., and director of the Medical Computer Center.

A graduate of Ursinus College,

Horrocks has also pursued graduate studies in applied statistics.

• • • LAURA G. STOLOWITZ has been named to the newly created position of vice-president of management systems for Compupro in Hayward, Calif. She is responsible for the company's internal management information systems.

Prior to joining Compupro, Stolowitz was with the city of Oakland, Calif., for two years as manager of computer operations while acting as a consultant for Godbout Electronics, responsible for the evaluation of accounting software. She also spent two years at Robert A. McNeil Corp. in San Mateo, Calif., as a senior systems analyst.

Previously she served as the manager of data processing for the South County Joint Junior College District, Hayward, Calif., and the Contra Costa Community College District, Martinez, Calif., from 1965 to 1976.

Since that time, Stolowitz has worked as an independent data processing consultant for a variety of clients ranging from a collateral loan company to the microcomputer business in addition to her other responsibilities.

• • • EMMETT WESSEL has been appointed director of systems and programming for Heritage Computer Corp. in Sheboygan, Wis., a supplier of software for the insurance industry. He will be responsible for all Heritage's systems work.

Wessel joined Heritage directly from Allen Bradley Corp., a Milwaukee-based manufacturing firm, where his primary responsibilities included development and maintenance of inventory, production control and purchasing systems.

He is a graduate of North Central Technical Institute in Wausau, Wis., where he majored in information sciences and accounting.

• • • PAULA L. LORING has been ap-

pointed director of management information services for Cushman & Wakefield in New York. She will be responsible for all existing information service operations as well as for the development of new computer services.

Loring began her career as a designer of computer systems and software with Honeywell, Inc. and the Mitre Corp. Most recently, she served as a senior systems consultant with Arthur D. Little, Inc.

Loring holds a bachelor of science degree in electrical engineering from Rensselaer Polytechnic Institute, a master of science degree from the University of Illinois and a master of business administration from Boston University.

• • • HENRY E. MORELLI has been appointed to the new position of vice-president of management information systems (MIS) for Datapoint Corp. in San Antonio, Texas. He will be heading an effort to reorganize all the decentralized MIS activities within the company.

Before joining Datapoint, Morelli spent eight years with Racal-Milgo, Inc. in Miami, where he was director of the MIS group. He has also held various information systems management positions with IBM and Informatics, Inc.

Morelli is a graduate of Pace University, where he earned BBA and MBA degrees.

• • • EDWARD C. BUTLER has been promoted from director of data processing to vice-president of management information services for Robb, Peck, McCooney Clearing Corp. in New York.

He is responsible for the development of data processing and communications systems for the Wall Street securities firm.

Butler attended St. John's University in New York, receiving a bachelor's degree in economics.

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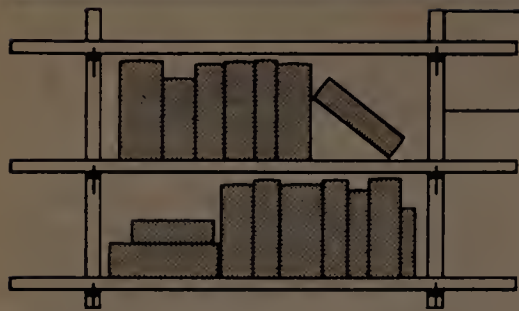
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THE AMAZING RACE: WINNING THE TECHNORIVALRY WITH JAPAN

By William H. Davidson

If Ed Feigenbaum's *The Fifth Generation* convinced you America was doomed to second place in the world of future computers, consider Davidson's more optimistic view: "Japan will not experience the same success in this sector that they have experienced in others. Even though Japan is concentrating formidable resources . . . the response of U.S. in-

dustry and government will limit their successes."

Davidson cites six product markets in which the Japanese have been able to win no more than 5% of world sales: low-end amateur cameras, consumer power tools, outboard motors, lawn and garden equipment and chain saws and tractors. Each is dominated by a single, large firm that was established long before the foreign competition arrived. Each remains vigorous in defending its position.

Not surprisingly, Davidson leads off the next section reviewing the ability of the computer industry monolith, IBM, to defend its home territory. He concludes that product standardization, advanced-process

Off the Press

Publishers wishing to have their books considered for review can direct press releases, catalogs or other information to George Harrar, Book Review Editor, Computerworld, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

technology manufacturing facilities, the reunification of the sales force and new mass distribution channels signal a company ready to withstand Japanese aggression in the main-frame business.

A major difference between *The Fifth Generation* and *The Amazing Race* is the latter's description of the Japa-

nese industrial strategy as it worked from 1959 to 1979. National planning, resource allocation, labor relations and other aspects of the economic system are analyzed to uncover the strengths and weaknesses of the Japanese in the '80s.

John Wiley is backing *The Amazing Race* for its November publication with a large advertising budget and a 20,000-copy first printing. Clearly, the publishers are banking on a market for a second book pitting Japan and the U.S. in a race to the future.

Hardcover, 225 pages, \$17.95, ISBN 0-471-88711-0, November publication. John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10158.

IBM AND THE U.S. DATA PROCESSING INDUSTRY: AN ECONOMIC HISTORY

By Franklin Fisher, James McKie And Richard Mancke

Here is an economic history of the industry as seen through the eyes of those who testified at one of its most spectacular trials — U.S. vs. IBM. By drawing from speeches, memos, letters and recollections, the authors create an inside view of how IBM operated in the marketplace and how other companies responded.

The story recounts IBM management's rejection of relatively safe alternatives, choosing instead to "bet the company" on a single line, the IBM 360; to make obsolete its successful system even as it was contributing heavy rental income, before someone else made it obsolete; and to make the tricky decision when to announce the 360 as a response to new Honeywell, Inc. and Control Data Corp. models.

A year and a half after the April 7, 1964, product announcement, the order backlog for 360s almost tripled IBM's worldwide annual sales revenue from all products. From 1964 to 1967 the company increased its work force by 50%, up to 50,000. The frantic response of competitors included price slashing at CDC and new products from Sperry Corp. and Burroughs Corp.

The book declares IBM to be the center of this economic history, but there is much of interest about the non-IBM world, such as the circumstances under which General Electric Co. and RCA Corp. dropped out of the computer industry picture and the factors leading to Sperry's resurgence.

Hardcover, 533 pages, \$37.95, ISBN 0-03-063059-2. Praeger Publishers, 521 Fifth Ave., New York, N.Y. 10175.

THE PERSONAL COMPUTER IN BUSINESS BOOK

By Peter A. McWilliams

The byline should forewarn the reader that he is about to be led through the merry world of personal business computers with a very strange guide indeed. McWilliams, for the uninitiated, is the best-selling author of *The Personal Computer Book* and *The Word Processing Book*, among others. He directs his insight and insult at the ever-expanding world of computers, particularly at people's grand expectations of what these machines can do for them.

The illustrations are among the

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Off the Press

most incongruous of any book — for instance, artwork clipped from catalogs of pre-20th-century drawings or old photos included for no other reason than that McWilliams obviously likes them (see Coca-Cola ad, page 126 — "Caffeine. Always had it. Always will."). The art conveys some not-so-subtle messages at times, as in illustrations of the Army squad paddling a pontoon on hard ground (military error without a computer) and an atom bomb explosion (military error with a computer).

The first reaction to all of this could easily be, "I don't have time to read a funny book about personal business computers." But as a manager possibly integrating micros or word processing into the office, you should consider recommending this book as an introduction for anyone in the company reluctant to use a desktop. McWilliams demystifies and simplifies. He knows who he is writing to.

The brand-name buying guide at the end relates McWilliams' personal experience with personal computers. In a previous review of the Osborne Computer Corp. Executive model, he described the new 7-in. screen as little better than the 5-in. screen of the Osborne 1. McWilliams tells us that shortly thereafter, Osborne Chairman of the Board Adam Osborne called to complain and offer an Executive for the writer to try out for a while. McWilliams accepted; but the trial didn't quite convince him: the machine sounded like a vacuum cleaner; the keystrokes "felt like several layers of innertubes were at the bottom of each stroke"; and the screen appeared several shades of orange, "not unlike a punk rocker's hair," he said. So much for the Executive.

Paperback, 287 pages, \$9.95, ISBN 345-31294-5, October publication. Prelude Press, Box 69773, Los Angeles, Calif. 90069.

DBMS FOR DISTRIBUTED COMPUTERS AND NETWORKS By Dimitris N. Chorafas

Data base management systems, perhaps the most recent "status tool" of data processing, have found general acceptance but remain to be fully utilized. The book explains how the DP manager can integrate diverse and often dispersed information systems.

The author explores the use of DBMS in the distributed environment, which naturally demands on-line capability. Going on-line requires, in turn, local and long-haul networks to tie together minicomputers and microcomputers.

This book begins with the development of DBMS and then emphasizes implementation, including what is available for minicomputers and microcomputers. The last half stresses the user environment — user-level protocols, sessions control, presentation control, distributed data base management and system integrity.

Regarding system integrity, Chorafas writes: "Most of the DBMS in use today contain integrity capabilities, though users and prospective users often fail to analyse, identify and evaluate these in relation to

their requirements. In spite of the fact that they are not used to full extent, most DBMS do protect against a variety of possible errors."

Hardcover, 255 pages, \$24.95, ISBN 089433-184-1. Petrocelli Books, Inc., 1101 State Road, Princeton, N.J. 08540.

Books of Note

COMPUTER GRAPHICS AND REPORTING FINANCIAL DATA, by Irwin M. Jarett: 360 pages, \$49.95, ISBN 0471-86761-6. John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10158.

PLANNING THE ELECTRONIC OFFICE, by Elaine Cohen and Aaron Cohen: 241 pages, \$37.50, ISBN 0-07-011583-4. McGraw-Hill Book Co.,

1221 Ave. of the Americas, New York, N.Y. 10020.

PROGRAMMING FOR SOFTWARE SHARING, edited by D.T. Muxworthy: 283 pages, \$39.50, ISBN 90-277-1591-2. D. Reidel Publishing Co., Inc., 190 Old Derby St., Hingham, Mass. 02043.

COMPUTER LITIGATION: RESOLVING COMPUTER RELATED DISPUTES AND PROTECTING PROPRIETARY RIGHTS: 794 pages, \$35. Practising Law Institute, 810 Seventh Ave., New York, N.Y. 10019.

THE DIRECTORY OF OFFICE INFORMATION SYSTEMS, by the Association of Information Systems Professionals: 300 pages, \$34.95, ISBN 931634-02-4. Information



Clearing House, Inc., 500 Fifth Ave., New York, N.Y. 10110.

CONCEPTUAL STRUCTURES: INFORMATION PROCESSING IN MIND AND MACHINE, by J.F. Sowa: 481 pages, ISBN 0-201-14472-7. Addison-Wesley Publishing Co., Reading, Mass. 01867.

OFFICE AUTOMATION AND WORD PROCESSING FUNDAMENTALS, by Shirley A. Waterhouse: 356 pages, \$14.50, ISBN 0-06-046955-2. Harper & Row, 10 E. 53rd St., New York, N.Y. 10022.

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Absence of Paperwork Ups Selling Time

Insurer's Sales Jump Tied to Office Automation

COLUMBUS, Ohio — When a major national insurance company discovered that excessive paperwork was cutting into agents' selling time, it decided that office automation and links to regional and national offices might solve the problem.

Reportedly the 11th largest insurance company in the U.S., Nationwide Insurance Co. here had 1982 net-written premiums of \$2.6 billion and utilizes approximately 5,000 agents in its marketing force.

More than 17 vendors were evaluated before Mohawk Data Sciences Corp. (MDS) of Parsippany, N.J., was selected last year, according to company officials. In addition to attrac-

tive price and maintenance agreements, "MDS offered the greatest opportunity to expand the system without having to replace any equipment," according to George Frink, vice-president of marketing services.

Nationwide's Agency Office Automation (AOA) system, a distributed processing system that links agency and company offices in a network of data communications and data processing, was established with MDS' Series 21 systems. Installations are scheduled at the rate of 80 per month.

Each Series 21 office system supports up to eight workstations built around a Zilog, Inc. Z80-based pro-

cessing unit with memory up to 512K bytes, internal disk storage of up to 75M bytes and a selection of printers.

With the Series 21, nightly updates of information are completely unattended. When communications are to take place, the Tandem Computer, Inc. Nonstop minicomputer host at Nationwide headquarters calls the internal modem of each Series 21, automatically powering the systems on and off.

All applications, except an MDS word processing program — Word 21 — were jointly developed at corporate headquarters by Nationwide and MDS personnel. The applications include networking for nightly

updates using Tandem's Nonstop, also provided by MDS.

MDS provided a cross-compiler for programming productivity and development. All development is on the host computer and is cross-compiled for execution on the Series 21.

Increased Sales

According to Frink, agents using AOA have increased automobile insurance sales by 23% for the first two months of 1983 over the same months in 1982; sales without the system have gone up only 13.9%. Life insurance sales using AOA are increasing 15.5% for the same period as compared with 5.1% last year. He estimated 85% of the company's business can be handled without an intermediary, error rates have dropped from about 25% to 5% and the internal information cycle has dropped from 20 days to two days.

AOA equipment arrives in an agent's office complete with customer files. Policyholder information is extracted from the central data base and loaded into the computers before it is shipped to the field. The agents pay a one-year lease charge for AOA, with optional renewal based on agency size and number of policies.

Applications have been created in four major groups: Service Aids to create information for customers; Training Aids to assist agents in the overall use of the system; Office Aids, under final development, with electronic calendar, electronic mail, computer-generated reports and word processing; and Computer Assisted Training packages, also in development, to train agents on new applications, insurance products and procedures.

Support Center Hotline

The company also maintains a 24-hour Support Center Hotline, manned by Nationwide and MDS service personnel, for assistance with equipment and programming problems.

Virgil Pittman, vice-president of systems and data processing, predicted that "AOA will be the vehicle for change in the way we deliver insurance in the future. We're just touching the tip of an iceberg. In two years, we'll be doing things we never thought about.

It's almost like a snowball that's heading downhill; we're getting more and more momentum by the minute," he said.

The AOA network, when completed, will utilize more than 3,500 MDS Series 21(R) DDP systems.

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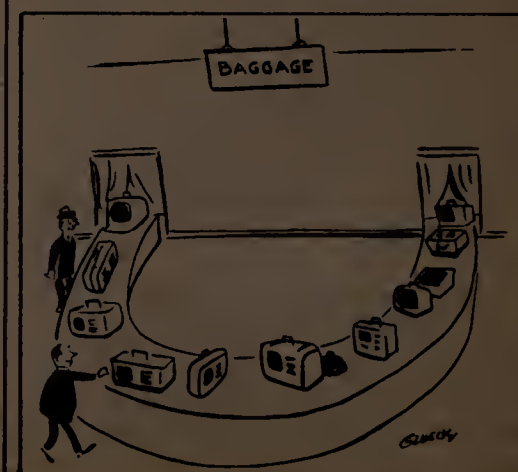
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Hiring? Some Tips for Interviewers

Q Even though my consulting business is relatively successful, I occasionally interview for a job if it is sufficiently appealing. A recent ad for a management information systems (MIS) director who reports to the president of a large hospital caught my attention. This is what happened.

About three weeks after I submitted my resume, a consultant in the employ of the hospital called and invited me for an interview. He implied that the phone call was an initial screen. He said that 140 applications had been narrowed to 14 and that I was selected from the 14 for an on-site interview.

When I arrived for the interview, I found out that it, too, was a screen. I did not talk to the president or any of the vice-presidents. I was not offered a cup of coffee, nor was I escorted between offices. I was just sort of pointed in the right direction.

After completing the interview schedule, I again spoke with the consultant, who asked me what computer I would install and what software I would buy. Good grief! I had only been there three hours and talked briefly with only one person in the computer center.

It has now been a month since that interview, and I haven't heard one word. However, I was warned; the consultant's parting words were, "If you get tired of waiting to hear from us, it's OK to call to find out what is happening."

They didn't seem to understand that although they were interviewing me, I was interviewing them as well. There has been much written in the trade press recently about techniques for the job interviewee, but little direction for the interviewer.

A After inviting the most qualified applicants in for on-site interviews, companies seem to take one of two rather diverse approaches in recruiting MIS directors. In the first approach, companies carefully prepare for each visit in order to optimize the information interchange. Management (including the president) makes every effort to make the candidate feel welcome and needed and that his visit is the single most important activity of the day.

The other approach is more impromptu. When the candidate arrives for the interview, the contact person quickly calls a few people (in the presence of the candidate) to find someone (anyone) who will talk to the candidate.

After all the first-round candidates reject offers of employment, the company increases the salary and invites the second-choice candidates in for another round of interviews. The company continues to raise the salary and lower their expectations until someone is hired. This approach results in paying the *most* money for the *least* qualified person.

Q Would you recommend special consideration in recruiting DP personnel?

Except for an occasional opening in another area, the bulk of our company's white-collar hiring is in data processing. Recruiting good people is tough enough without the red tape of the personnel department.

We have lost several good prospects because of delays of up to five weeks in processing an offer. Do other DP departments do their own recruiting and hiring?

A Full-time DP recruiters are common in companies that hire 25 or more data processing people a year. Some smaller DP departments also handle the recruiting function, primarily because of

the technical nature of the positions involved.

If nothing can be done to improve the service and turnaround in the personnel department, then you should take whatever action is required to absorb the function within your department. Good people are simply not willing to wait five weeks for a response.

Q "Don't use my name," and "Please treat the following as confidential with respect to my name and address."

A Similar phrases are appended to many of the letters that I receive. I want to reiterate that the confidentiality of Turn-

Turnaround Time

By Larry E. Long

around Time correspondence is carefully guarded.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.



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Bank of Calif. Reaps Dividends After Changing

By Jeffrey Beeler

CW West Coast Bureau

SAN FRANCISCO — A local bank that serves a narrowly defined customer base is already reaping dividends from a recently completed move to regain internal control over its information processing resources.

In May, the Bank of California here concluded a nearly 18-month-long effort to transfer all its data, programs and computing capabilities from an outside DP services supplier to its new in-house computing center.

Developed from scratch during the first quarter of last year, the data center is the first such facility that the institution has operated internally since 1974, according to Bank of California Vice-President Subhash Patankar.

The new center is deemed necessary to ensure the bank's continued prosperity during the fast-approaching era of banking deregulation, which will greatly increase

competition among financial institutions and force them to expand and upgrade their customer services.

Patankar credits the data center and the accompanying transfer of systems resources with significantly speeding the development of the Bank of California's applications. This increased programming productivity, in turn, shortens the bank's lead time in bringing new fi-

nancial products and services to the market and thus gives the institution an important business edge over its competitors, he said.

The migration of the bank's systems resources to its new in-house data center was completed one month ahead of schedule and cost 5% less than originally projected, for a savings of about \$100,000, according to Patankar.

One reason the migration went so smoothly is that it was managed and closely monitored by a 12-member project team that met frequently to review progress and conferred regularly with the bank's management, he explained.

Other reasons for the mission's success are that the effort was conducted in two phases — one for on-line applications and another for

DSS Meet To Be Held In November

SAN FRANCISCO — "Decision Support Systems" (DSS) is the subject of a three-day conference that will be held here Nov. 30 to Dec. 2.

Sponsored by the National Institute for Management Research (NIMR), the conference will focus on the application of new computer hardware, software, communication approaches and management techniques to develop decision making models for corporations.

Also covered will be the integration of mainframe and microcomputer linkage and the technical use of management information systems for implementing decision support systems.

Targeted at financial managers, systems planners, office automation managers and information center managers, the conference will include sessions on DSS implementation, financial and operational applications and DSS case studies.

The conference will include representatives from Atlantic Richfield Co., Shaker Corp., McCormack & Dodge Corp. and Execucom Systems Corp.

The registration fee for the conference is \$595 per person, and the team price is \$295.

More information is available from NIMR, through Box 3727, Santa Monica, Calif. 90403.



'I Guess You Might Call It a Terminal Illness, But One That Can Be Cured.'



From Outside Supplier to In-House Data Center

batch jobs — and that standards and procedures for the new data center were implemented gradually.

Although Patankar's employer differs from many other banks in the types of customers it serves — it specializes in middle corporate and high-end private accounts — the organization typifies financial institutions in at least one important respect: Its success or failure as

a commercial enterprise is determined by the value of the financial information it makes available to its depositors.

"We may think that what we're selling to our customers is money, but every other bank has money, too," Patankar said. "What we're really selling — what truly sets us apart from other banks — is information."

But to provide customers

with top-quality information, the Bank of California must be able to bring new on-line products to the market quickly, which was precisely the problem it faced with its former DP services supplier.

With the outside vendor — Dallas-based Electronic Data Systems Corp. (EDS) — the bank was finding its efforts to develop and introduce new financial services

increasingly restricted, Patankar recalled.

To satisfy its customers' growing demand for new on-line financial products, the Bank of California needs as efficient a program development system as possible — a facility like IBM's TSO or one of its competitors. But a TSO-like capability was unavailable from EDS, which provides its own less effective program development

tool and is committed to the product's continued support, Patankar said.

EDS' inability to meet the bank's program development needs was beginning to undercut the institution's responsiveness to customer demands and therefore its ability to compete in an increasingly deregulated environment.

"In the kinds of markets we deal with, customers want new services immediately, and if you can't respond quickly, they're apt to take their business elsewhere," according to Patankar.

Another problem that prompted the Bank of California to sever its EDS ties and install its own in-house data center was cost. As long as the bank's processing load consisted primarily of batch jobs, EDS' rates remained reasonably competitive.

But as the center of gravity in the institution's processing load began to shift from batch to on-line applications, the Dallas company's prices became increasingly steep. "Our feasibility studies showed that as more and more on-line services came on stream, our costs would continue to rise — and at an accelerated rate," Patankar said.

Two-Phase Effort

So early last year, the bank embarked on a two-phase effort to transfer its systems resources from EDS to the internal data center, which houses two IBM 4341-II's running MVS/SP 1.3 and TSO.

The first stage, which began last February and ended in September, concentrated on migrating the bank's on-line applications and electronic banking functions.

Last October, after the first half of the migration project had been completed and had been pronounced a success, the Bank of California proceeded to the second phase, which focused on transferring the institution's batch jobs and Regional Communications Network.

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Experts Doubtful of DP Lawyers' Qualifications

By Jim Bartimo
CW Staff

While some law firms around the country have established special groups to handle computer and high-technology cases, other legal experts recently interviewed by *Computerworld* are doubtful that these groups can really solve the legal needs of those in the computer industry.

Some experts fear that

there are not currently enough qualified lawyers to staff these newly emerging departments. Others say that such a department would prove an ideal training ground for the large numbers of lawyers needed to meet the predicted flood of future computer litigation.

"We're starting a department of five lawyers, and we will add more as we need them," according to Mat-

'While most experts agree that while there may not be many qualified lawyers in the field, there is a growing need for lawyers with this expertise. In addition, many young lawyers just out of law school want to learn about computer law and make it their profession.'

thew Brown, senior partner at the Boston law firm of Brown, Rudnick, Freed & Gesmer. The group will deal with the legal aspects of sys-

tems, software and other technologies such as bioengineering, cryogenics, lasers, robots, medical engineering and fiber optics.

"The group is designed to have the field of high tech covered," Brown said. But "lawyers who know the field" are scarce, according to Washington, D.C., computer lawyer August Bequai. "I haven't seen many good high-tech people out there," he said. "Some of the big firms are going to start doing this, but I would go to a smaller personalized firm because the big firms are going to parcel it out to experts anyway."

Another legal specialist lodged similar criticism. "There are a lot of lawyers out there who are saying they are computer lawyers, and they don't know what they're doing," said Jay Westemeier, a partner in the Washington, D.C., law firm of Abrams, Kovacs, Westemeier and Goldberg, P.C. and chairman of the American Bar Association's Committee on Professionalism and Malpractice of Computer Specialists.

Positive Sign

But another expert said that these departments are a positive sign of things to come. "It represents a commitment. It's important that these firms contemplate the technology," according to Daniel Brook of the suburban Washington, D.C., Computer Law Advisers. These departments could become a training ground where lawyers learn to apply existing laws to the new technology, Brook said.

Gaston Snow & Ely Bartlett is one firm that has had an established computer and technology group since 1980 with 25 lawyers involved in the group in its five offices around the country. "We started out with a strong nucleus and built on it," said Susan Nycum, who is based in Palo Alto, Calif.

Nycum agreed that many computer lawyers are inept, but sees her department as one way to ensure there are qualified lawyers in the field. "I fully expect there will be younger people who will go out and offer services in cities [where] we don't have offices," she said.

While most experts agree that while there may not be many qualified lawyers in the field, there is a growing need for lawyers with this expertise. In addition, many young lawyers just out of law school want to learn about computer law and make it their profession.

"We found that computer law is the fastest growing area in our firm," Westemeier said. But despite this, "There are more people who want jobs in this field than there are jobs."



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County's Turnkey Keeps Up With Rapid Growth

LOS LUNAS, N.M. — Purchasing an in-house turnkey system has cut property tax information processing time significantly for officials at the Valencia County Courthouse here.

Prior to installing the turnkey system less than a year ago, Valencia relied on neighboring Bernalillo County to handle all property tax data processing. When this method was first implemented in the early '70s, it proved feasible. But as the years passed, "a lot of changes in [Valencia] county made it increasingly impractical," according to Valencia County Treasurer James Fernandez.

For one, Valencia County was growing at such an enormous rate that Bernalillo County's computer system could not keep up with Valencia's DP needs. Eventually it became impossible to keep all of Valencia's tax records on-line at one time.

Also, Valencia's property tax roll is the second largest in New Mexico. Nearly 130,000 plots of land are now being processed annually, a majority of which are sent to out-of-state owners.

Because of the rapidly growing number of parcels, a tremendous backlog resulted, "and that's when the real problems started," Fernandez continued. "All information had to be hand carried up to Albuquerque [N.M.], then after processing, back to Los Lunas. The system was slow, cumbersome and costly."

Once records were returned to the Valencia courthouse, they were manually entered into tax-receipt books, slowing the process even further. Checks were held in the county vault for months with many passing their expiration dates or being returned due to closed accounts or stop-payment orders. Because it was difficult to determine who owed what, follow-up procedures on delinquent taxpayers were severely neglected and in some cases abandoned.

The Decision to Purchase

Then, in early 1982, Bernalillo County raised its processing fees and announced a new method of submitting data. This spurred Valencia officials to consider the possibility of having the county purchase its own computer system.

A subcommittee was formed that received proposals from several computer vendors, eventually narrowing down its candidates to three. "Hardware, software and on-going support, as well as price, were the key elements we weighed in selecting a finalist. Western Programmers, Inc. [WPI] was our choice then, and I'm very pleased with them now," committee member Archie Farnsworth, also an engineer at Sandia Corp., said.

In July 1982, WPI, an Albuquerque-based computer specialist firm, was awarded a contract, and 30 days later, a temporary turnkey system was installed. Running parallel with Bernalillo County until the permanent system could be implemented was ruled out due to a lack of funds. In December 1982 the permanent system became operational.

The new system includes 20 Digital Equipment Corp. VT100 computer terminals, an expandable DEC Datasystem 11/44 computer with 1M

byte of main memory, 912M bytes of disk storage and customized software for county operations. Most of the data being processed involves property-tax information for the county such as tax schedules, rolls, bills, receipts and delinquent notices.

Since the turnkey system's installation, an impressive list of accomplishments has been recorded in several areas, most notably in the offices of the county treasurer and assessor. "Instead of processing 4,000 to 5,000 tax statements a week, we now handle that amount each day. We're clearing checks faster, too, bringing more money more quickly into the county coffers," noted Treasurer Fernandez.

The new system has proved bene-

ficial regarding delinquent taxpayers. A computer search through 10 years of tax records produced a print-out of over 1 million taxpayer records with some 30,000 delinquencies. "Obviously there are numerous errors," Fernandez said, "but we're currently sorting through the files, learning who's really delinquent and who is not." The updated information is being fed into the DEC Datasystem.

Other benefits to the county have included elimination of bulky tax-receipt books and instant availability of budget information. "We're catching up on delinquencies; we're getting tax bills out on time; and for the first time ever, we're really on top of things," Fernandez said.

By saving time, the computer is also saving money. One county official who realizes the full impact of the savings is Assistant County Manager and Fiscal Officer Barbara Beattie. She believes officials will become more budget-conscious.

"By having our own computer, we will run the county on a more cost-efficient basis," Beattie believes. In her opinion, this is especially important because of Valencia's accelerated rate of growth. The DEC Datasystem allows for a great deal of expansion, and as the county grows, "we'll use it more and more," she said. "Eventually everything in the courthouse will be computerized and organized through our ongoing support program with Western Programmers."



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Micro System Gives Bank Competitive Edge

LE SUEUR, Minn. — A microcomputer system is helping a commercial bank here stay on solid financial footing now that competition among banks for deposits and profits is burgeoning.

Chief among the computer's tasks is the monitoring of Le Sueur State Bank's interest expense and interest income spreads, according to Bruce Olness, president of the bank.

Since January, a change in federal banking regulations has permitted financial institutions to offer savings and checking accounts with no upper limits on the interest that may be paid to depositors.

This lifting of restrictions allows Le Sueur State to compete directly against the high-rate money market funds that had siphoned assets from banks during the past three years; formerly, banks could only pay 5.25% per year in interest on savings, while the money markets were paying nearly 18% annual interest at one point in 1981.

Danger Involved

"We welcomed the opportunity to offer these insured money market-type accounts, but there was danger involved," said Olness.

"First, we worried that the accounts might backfire on us. We knew they would be attractive to investors, but we feared that the only takers would be those who open

the accounts by transferring the money out of lower paying accounts already established with this bank. That would have had the counterproductive effect of forcing us to pay more for money already entrusted to us," he said.

"Fortunately, that didn't happen. We used the computer to run an analysis of the deposit patterns, and it revealed that about 40% of the money fund accounts were opened with dollars brought into the bank from outside sources.

"That figure represented a healthy chunk of new money. However, it was at this point that the real worrying began for us," Olness said.

Those worries, said Olness, centered on maintaining a careful balance between the money earned by the bank from various types of loans and investments, and that paid by the bank for various types of deposits including the new money fund and its companion, super-NOW (negotiated order of withdrawal) checking accounts.

Olness explained that the bank is hurt whenever its payoff on the money fund accounts exceeds income from loan finance charges and investments — a circumstance that can occur easily because of pressures to keep interest rates for both deposits and loans at levels attractive to customers.

Olness is more comfort-

able than most bankers about the accounts because he has added programming to his existing software package that allows the microcomputer system to produce a daily report detailing the bank's income and expense status along with analyses of more than a half-dozen performance ratios.

Adjusted Rates

The ratios, taken together, enable Olness to determine how and where to adjust interest rates.

The performance ratios delineated by the computer include net assets (the total assets adjusted by liabilities and expenses), nonearning assets (such as buildings, fixtures and accrual accounts), capital-to-assets, spread-to-gross income, interest expense-to-gross income, return on equity and loans-to-deposits.

"By examining these ratios, I can learn which rate I must adjust — either the rate on loans or the rate on deposits — in order to keep the bank profitable," said Olness.

"Without the computer to provide this information, we would have a difficult time knowing our true standing until too late. If we were still utilizing the services of a correspondent bank in Minneapolis, we might not be able to know how right or wrong we were about our rates for 90 days after the fact," he said.

Spectrum of Documentation

Olness uses a Cado Systems Corp. System 20/28 microcomputer equipped with Bancado banking industry software to produce a spectrum of documentation on Le Sueur State's financial standing. The 8-bit, 96K-byte Cado System 20/28 is deployed in such a way at Le Sueur State that all employees have ready access to a workstation. One CRT terminal is located at the drive-up teller booth, two more at the teller windows in the lobby, and another in the bookkeeping room. A GE 420 LPM printer, a data capture device, and the central processor unit also are situated in the book-

keeping room.

Data storage is provided by a single 13.5M-byte Winchester disk drive affording at least two years of record retention before it reaches full capacity, given the bank's rate of data loading (records then are off-loaded onto hard copy and the disk reused).

Olness opted for the Cado system after considering and rejecting several major-manufacturer systems. According to Olness, the Cado computer was priced \$150,000 lower

than a mainframe computer proposed for the application. Not surprisingly, this cost differential was a decisive factor in the purchasing decision.

"Bringing a data processing capability in-house was one of our smartest moves," said Olness.

"We have a high volume of checking account activity and lobby traffic for a bank our size. As a result, our service bureau costs were running in excess of \$35,000 a year," he said.

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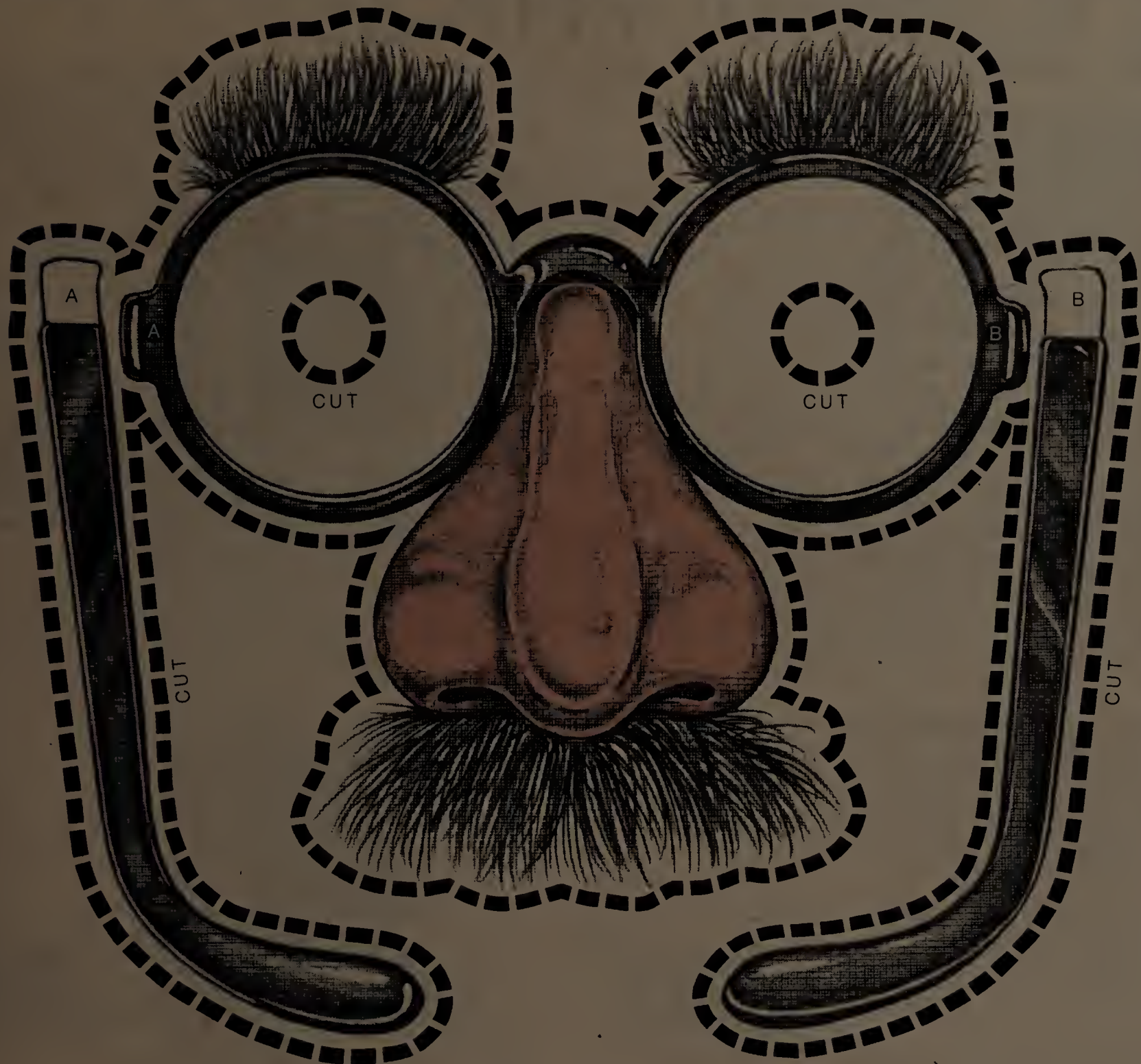
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1. *Datapro*: "User Ratings of Proprietary Software-COMLETE" November 1982. 2. *Computerworld*: December 20, 1982.

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Another Vendor's COM System Gets High Marks From Sperry

ROSEVILLE, Minn. — Large computer vendors may be the toughest customers to satisfy when they are on the other side of the purchasing fence. But when operating in user mode, Sperry Corp. gave high marks to another vendor's computer output microfilm (COM) system in use at manufacturing plants here and in Eagan, Minn.

At Sperry's Defense Systems Division headquarters in Eagan, a Dicomed Corp. D148B Precision Graphic COM system is used primarily as an engineering tool to generate functional schematics for printed circuit boards and printed circuit board schematics on 35mm microfilm, according to COM supervisor Mel Shulstad.

Sperry's Major Systems Division facility in Roseville uses the D148B for three major purposes: to create logic diagrams, or computer-aided logic design work; to generate manuals and other printed information; and to make check prints of printed circuit artwork before making expensive production-quality glass master artwork for printed circuit boards.

Both the Roseville and Eagan plants have used COM for over ten years, according to Paul Pontinen, imaging systems supervisor. In addition, a Sperry-developed prototype COM system has been in use at the Eagan plant for the past eight years, but according to Shulstad, the division outgrew the prototype system.

Search Committee Formed

Sperry assigned an executive committee to conduct an extensive study of several COM systems. That group chose the Dicomed D148B. Part of the deal with Dicomed required Sperry to develop specialized software to allow the Dicomed COM system to operate in conjunction with various plotters used at the Eagan and Roseville plants, Shulstad said.

Sperry's Roseville COM operation functions 24 hours a day, seven days a week, Pontinen said, adding, "We have found the system to be very reliable."

The Roseville plant purchased the D148B in July of 1980. All logic and generation for automatic computer-aided design is performed on a large-scale Sperry 1100 series mainframe. The system is formatted for a California Computer Products, Inc. plotter, Pontinen said.

"It takes the plotter 45 minutes to an hour to generate one drawing and that just wasn't fast enough," Pontinen explained. "The D148B

does the same plot for us in six to eight seconds. We couldn't have developed our systems in time without COM drawings."

In a second application, the Roseville plant uses the D148B to replace some of its high-speed printer requirements.

"On the D148B, we can photograph up to 200 frames

a minute. Turnaround time is extremely fast. But the biggest advantage is in storage and shipping costs," said Pontinen. To illustrate that point, Pontinen explained that it would take two large shipping cartons of 11-in. by 14-in. computer printouts to hold the same amount of information as approximately (Continued on Page 44)



Paul Pontinen is the imaging systems supervisor at Sperry's Roseville plant.

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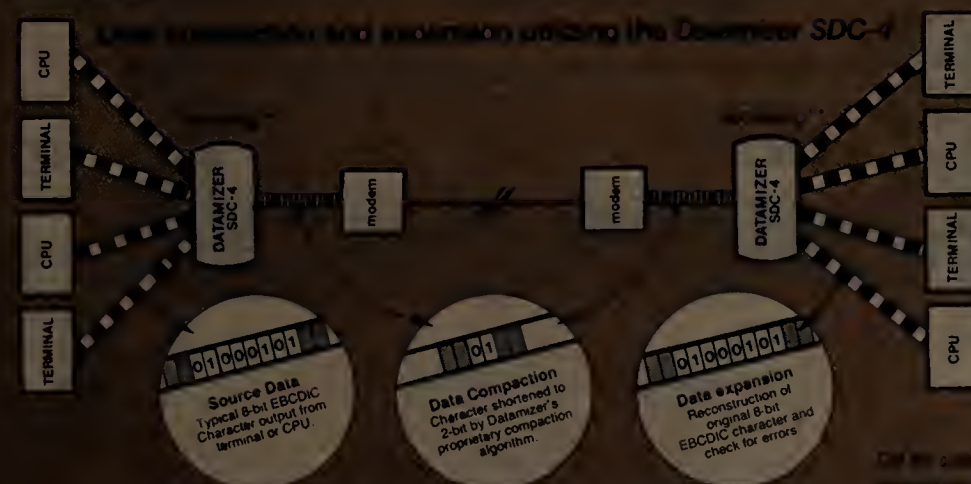
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Sperry Gives COM High Marks

(Continued from Page 43)

20 microfiche. "Mailing costs alone on the hard copy would be prohibitive," he said.

The Roseville plant also uses the D148B to check artwork before etching it onto glass on a Gerber Scientific Instrument Co. plotter. "Instead of initially running the design on the Gerber, which could take half a day, and then checking it, we can run it in 10 or 20 minutes on COM and then check it. That saves a lot of potential replotting," Pontinen noted.

Pontinen said he supervises two program analysts who program COM systems and associated software on the Sperry 1100 mainframe. He also supervises a system leader and six operators who manage the continuous, 24-hour operation of the D148B.

The department develops all software, runs programs, develops microfilm and runs quality control checks on the final microfilm product. The Roseville plant develops output on both 105mm microfiche and 35mm aperture cards, according to Pontinen.

Speed is the key to Pontinen's operations. "We're so used to COM that we don't know how we'd get along

without it," he said.

Sperry's Eagan plant also uses COM to save time. "We now run on microfilm in six to eight seconds what used to take approximately 20 minutes on the plotter," explained Shulstad.

The Eagan plant also is saving money by using COM. "A functional schematic for one computer drawer may contain as many as 600 drawings. When you compare plotting 600 cards at

20 minutes apiece to creating those same schematics directly from the computer tape to microfilm at six to eight seconds apiece, you can see that there's a big difference," Shulstad said.

"And that," he added, "is just kind of an average project for us." More complex projects, which take about half an hour on the Dicommed system, would take six to eight hours on a standard plotter, Shulstad explained.

Frisina to Address Forth Meet

PALO ALTO, Calif. — Tom Frisina, president of Androbot, Inc., is scheduled to address the Fifth Annual Forth National Convention at the Hyatt Palo Alto here on Saturday, Oct. 15.

The convention will be held Oct. 14-15 by the Forth Interest Group (FIG) and will focus on systems based on Forth, a language popular in industrial robotics.

Frisina's company has a number of personal robots to its credit, including Androman, Topo, Brains on Board (Bob) and the Friendly Robotic Educational Device (Fred).

Registration for the FIG convention is \$5; a Saturday banquet with Frisina is \$25 per person. Reservation and room-rate information can be obtained from FIG, P.O. Box 1105, San Carlos, Calif. 94070.

Dataquest to Host Conference On Voice, Data

SANTA CLARA, Calif. — A "Voice Meets Data Conference," addressing issues in the merging voice and data communications industries, will be sponsored by Dataquest, Inc.'s Telecommunications Industry Service at the Marriott Hotel here Oct. 31-Nov. 1.

Dataquest, a subsidiary of A.C. Nielsen Co., said the conference will bring together leaders from both industries to present their views on the merging of the industries over the next five years. Subjects covered during the conference will include local and remote communications involving telephones, display terminals, voice/data workstations, personal computers, minicomputers and mainframes.

The event is the first in a new Focus Conference Series sponsored by the company. Issues relating to technologies, local and remote networks, software protocols and high-level, end-user services are scheduled for discussion.

Conference fees will be \$395 for Dataquest clients and \$450 for others. Further information is available from Donna Bonyun, Dataquest, 1290 Ridder Park Drive, San Jose, Calif. 95131.

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Outdated System Lacked Adaptability

School Upgrades From Sigma to IBM, DEC Duo

FORT WORTH, Texas — With the maker of its nine-year-old mainframe no longer producing hardware and software upgrades, the data processing center of a major university here has decided to replace its outdated system with a high-end mainframe and a superminicomputer.

Since July 1974, Texas

Christian University's (TCU) computer center has been using a Xerox Corp. Sigma 9 mainframe to supply faculty, staff and students with various computing services. The system, which Xerox discontinued in the mid-'70s, has been maintained over the last several years by Honeywell, Inc.

According to Frank For-

ney, director of the school's computer center, the lack of adaptability, speed and storage capacity were the reasons TCU has decided to replace the system at the end of the 1983-84 academic year.

"No new equipment or software is being made available for the Sigma 9. Faculty members who use the computer center for teaching as

well as research want state-of-the-art facilities," he said.

Replacements for System

At a cost of \$2.4 million, TCU will replace the Xerox system with an IBM 4341 mainframe and a Digital Equipment Corp. VAX-11/780, Gandalf's Compacx data communications system, two IBM Series/1 minicomputers

and a high-speed pen plotter.

With the addition of the 4341 and VAX-11/780, Forney said, the center has improved its throughput capacity threefold to 2.4 million instructions per second and increased its storage capacity from 800M bytes to 4.8G bytes.

Unlike the Sigma 9, the two systems have an array of peripheral and software products from which to choose, thereby ensuring the center's ability to upgrade them.

Forney said the 4341 will be able to communicate with the VAX-11/780 through a hardware/software communications link. The center decided to go with the VAX-11/780, he explained, because of its ability to operate with a wide range of software packages and its capabilities' congruence with the needs of the school's computer science students and faculty.

TCU purchased 12 software packages, including seven statistical programs and five student/research programs, to run on the two large systems. These packages are in addition to the routines and packages TCU acquired directly from IBM and DEC.

Communications the Key

With over 200 terminals spread across TCU's campus, a heavy emphasis was placed on communications. The university believes Gandalf's Compacx system along with the two Series/1 systems will meet its needs.

The Compacx system provides direct entry of terminals to the host systems over leased lines, computer selectivity based on user authorization, high-speed data transfer rates and security provisions.

The Series/1 machines enable the school's 200 terminals to emulate the capabilities of an IBM 3270-type terminal, a spokesman for TCU said.

Forney said a major effort for the upcoming year will be to train faculty, administrators and students to operate the new equipment. Presently, he said, the Sigma 9 is supporting 28 administrative systems.

The computer center, which is staffed by 16 full-time employees, will offer 11 short courses during the 1983 fall semester.

The academic and administrative software will be installed and tested on a continuing basis throughout the year, the school said.

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City Handles Record Growth With WP System

SAN JOSE, Calif. — This city in the heart of Silicon Valley claims to be the fastest growing city in the U.S. Census figures substantiate that claim; they show that in the past 10 years, San Jose's population has increased from 460,000 to 629,000.

Naturally, as the number of residents has swelled, so has the paperwork at city hall. But the city's clerical staff has not increased. In

fact, overtime has diminished considerably, even during peak intervals such as budget preparation periods and fiscal year-end.

So who's doing all the extra paperwork? "Word processors," said Leona Bishop, information system processing coordinator for the city.

The city council approved the acquisition of the word processors in early 1980, based on the recommenda-

tions of the Office of Management and Budget (OMB). Plagued by increasing requests from various departments for word processing equipment to compensate for clerical staff reductions, the OMB had appointed the city's computer expert, Timothy Wei, director of information systems, to head up a task force to determine how the city's word processing funds could be best spent.

The task force began its study by reviewing the city's existing word processing resources. Various departments had already purchased several different stand-alone systems from Vydec, Inc.; Lanier Business Products, Inc.; and Wang Laboratories, Inc. Purchases were made with no coordinated planning.

"It was very inefficient," Wei recalled. "People could be experts on the system

they were working with, but if they were to be transferred to another department tomorrow, they'd have to be retrained.

"An even bigger disadvantage was that with the various incompatible stand-alones, different departments couldn't share information, files or programs, since each workstation was an entity unto itself."

Recommendation Accepted

The OMB accepted Wei's recommendation that a shared-resource system would best suit the city's needs. Task force members agreed that in order to get a head start toward standardization, they should confine their choice to one of the three vendors who had already supplied word processing equipment to the city — Lanier, Vydec and Wang.

Only one vendor met all task force requirements: Wang. A report dated March 3, 1980, from OMB to the mayor and the city council recommended that all stand-alone systems then in use, including the Lanier and Vydec equipment, be maintained, but that additional word processing requirements be filled by leasing from Wang a shared-resource word processing system with terminals in six departments.

By August 1980, a Wang OIS 140-III Shared Resources System was installed.

In general, the system has streamlined the city's routine paperwork. Currently, there are 28 peripherals (including workstations and printers) attached to one master unit. "All departments can borrow documents from each other through the lines without transferring disks," Bishop explained.

As for the city's specific applications of the system, the list is long, and it is growing as people become more aware of the system's capabilities. In addition to the usual word processing benefits that are common to all, each department is finding ways in which the system can help it specifically.

"We've just scratched the surface," said division head Loren Bonham. His staff analyst, Leslie Masunagan, agreed. "Some of the ways we're using it so far," she said, "are to produce organization charts, draw up job specifications, administer our benefits and retirement programs, produce quarterly personnel reports, record union contracts and negotiations and compile a personnel policy and procedures manual."

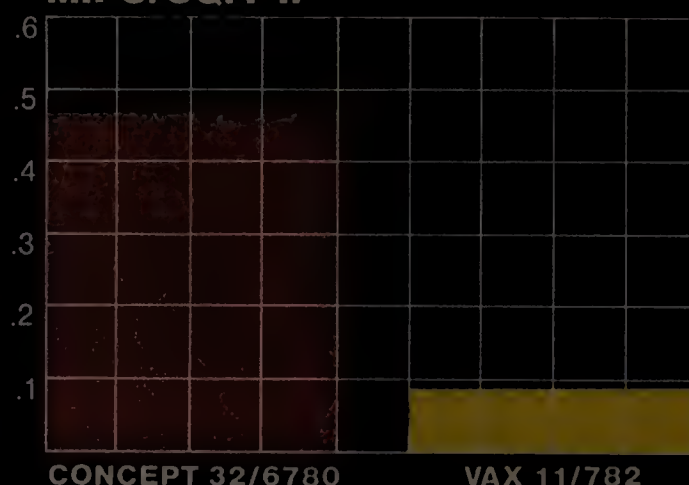
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Supplies Exploration Information

DBMS Keeps Data Flowing for Oil Firm

DENVER — Oil exploration has become an increasingly complex task. As world oil supplies become scarce and drilling costs skyrocket, oil exploration companies have sought more specific information to help them choose the right drilling sites. A firm here that supplies information to exploration firms has switched to an on-line data base management system (DBMS) to provide its clients with timely information.

Petroleum Information Corp. (PI), compiles data files in the major areas of active drilling, historical wells, hydrocarbon production and industry statistics. The firm's records go back as far as the mid-1800s. The information is duplicated with one copy stored on an IBM 3033 Model U processor and the other on an IBM 3081 Model Group K processor.

PI formerly compiled information for its clients in hard-copy reports. When those firms, who are primarily users of large IBM mainframes, wanted information faster and in a format that could be used on their computer systems, PI began offering the data on magnetic tape and microfilm. Recently, the firm decided to offer the information on an on-line basis using the Model 204 DBMS developed by Computer Corp. of America.

On-Line Advantage

The advantage of the on-line DBMS is that users have more time to evaluate the PI data. A geologist, for example, researching an area for possible oil deposits, begins by compiling data on the geologic history of the area. In the past, he manually pulled the completion cards for each well. These cards gave information on the age and detailed characteristics of rock types and the subsurface strata. Production histories of wells in the area, pulled from hard-copy reports, further helped to assess the probability of success, explained PI's on-line software support specialist, Matt Redling.

Plotted by hand on a map of the area, this data helps build a picture of the subsur-

face. With experience and the occasional inspiration or hunch, the geologist develops an idea or a prospect from this picture. Manually, this process can take weeks or months. With on-line communications to the PI data bases, it can be done in hours, Redling said.

Realizing the potential and the growing demand for

on-line capability, PI decided in March 1982 to add full on-line access to its hard-copy and tape distribution systems. "This was a tremendous challenge," Redling said, adding, "with a data base the size of ours — 300G bytes — this usually takes at least a year. We had to find a data base management system that would enable quick-

er development of this large body of data.

PI was using Cullinet Software, Inc.'s IDMS DBMS to input the information into its in-house data bases. However, the firm decided that IDMS would not support integrated, on-line access by a large number of concurrent users. In addition, the firm felt the Model

204 DBMS was better suited to serve drilling supply sales staff or geologists, who typically are not trained programmers, Redling said.

Best of Two Forms

In order to build its own DBMS in a short time, PI needed the best features of two different forms of
(Continued on Page 50)

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Maker of Aircraft Engines Ties Data Base

WEST PALM BEACH, Fla. — A data base system and computer-aided engineering (CAE) applications are major tools tying together the engineering divisions of the world's largest supplier of aircraft engines here.

On-Line Data Well Oiled

(Continued from Page 48)

DBMS: the designer and end-user systems. The designer system, characteristically hierarchical in structure, could easily accommodate PI's large-scale data base but would have taken longer to develop. Its hierarchical structure also meant that users have to sift through layers of information to get what they want, Redling said.

The end-user system, on the other hand, could be developed quickly to allow users to call up specific data. But partly due to the simplicity of its architecture, it is suitable only for small data bases.

Looking for a solution to this dilemma, PI contacted a local oil exploration company that used a large-scale DBMS, Redling recalled.

"This is where we first saw Model 204 in operation. It effectively combined the features we were looking for. After learning of this system, it took us all of two weeks to decide that this was the one we wanted," Redling said.

Speed of start-up was the single most important factor in PI's decision. This "rapid deployment" is made possible by the fact that Model 204's development language and user language are both native to the DBMS nucleus. This nucleus directly interfaces to IBM's teleprocessing access methods, eliminating the need for a teleprocessing monitor to develop an on-line user language as a separate operation, according to Redling.

Ease of retrieval was, in Redling's term, "the icing on the cake" for the Model 204. Its inverted file structure means the user never sees the data until it is retrieved. With the inversion available, the user can go right to the exact data he wants without fishing through files, he explained.

PI uses a version of Model 204 oriented to IBM's MVS operating system. The DBMS houses four sub-data-bases, or categories of information. The company keeps two copies — one in-house and one remote. These categories coincide with what can be seen as the life cycle of a well. The data gives explorers, suppliers, drilling contractors and operators the information they need at every

Pratt & Whitney Aircraft (PWA), uses the data base system to provide division-wide notice of design modifications and to simulate engine failures, according to a spokesman.

Developing a specific engine for a specific aircraft is primarily a matter of integrating existing or emerging technologies to meet performance criteria. Since individual parts must be modified so that all parts work together within the total engine, and because a dozen or more engineering departments may be involved in the project, computerization is vital.

PWA's Government Products Division (GPD), located here, designs engines for military aircraft, including the F-14, F-15 and F-16 fighter and the Blackbird reconnaissance plane. GPD employs about 2,000 engineers, 75% of whom regularly utilize computers in their work.

Growing Sophistication

PWA's use of computerized engineering applications dates from the mid-

1950s, and, like the engines the company designs, both equipment and software have grown increasingly sophisticated over the years. GPD currently has two IBM 3081 disk storage devices, two IBM 3800 printers and 200 IBM 3279 color terminals dedicated to engineering. Approximately 300 of the 2,500 engineering design programs developed at PWA are used daily.

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to CAE Applications on Divisional Scale

Since it is impossible to create radically new technology during the brief design phase of a particular engine, engine design is an ongoing activity. For example, PWA's metallurgical engineers constantly strive to develop alloys that will withstand greater engine temperatures. The firm also devotes a great deal of attention to "preliminary design" — projecting the engines that will be

needed 10 years hence, determining the required components and performing the initial design of those components for future use.

At one level, PWA's design applications facilitate the development of a single engine part. But the designer is not operating in a vacuum. His "final" design may be rendered unworkable by modifications to other engine components. The de-

sign system allows immediate communication of changes via a single data base — constantly updated and accessible to company engineers. Depending on user needs, engineering applications can display or print either graphics or alphanumeric information.

"I can't overemphasize the importance of the data base," Clarence Borgmeyer, divisional manager of com-

putation methods, said. "There must be a relationship among our engineering departments. The impact of any modification must be available throughout the division. That sort of interaction is impossible without our computer system."

Potential Failure

Another PWA engineering application is the simulation of potential engine fail-

ures. The company's Failure Mode and Effect Analysis (FMEA) programs permit the company to simulate various malfunctions and build in margins to protect against them. "With computer simulation, we can test for most failures at virtually no cost," Borgmeyer said.

When design of a particular GPD engine part is complete, the part is released to PWA's manufacturing division in Hartford, Conn., or to an outside vendor. At this point, the computer provides appropriate documentation: drawings, produced on a plotter; numerical control tapes; computer-to-computer numerical control information; and bills of material. The assembled engine is returned to West Palm Beach, where another group of design programs analyzes its performance. Test results are immediately incorporated in the data base to expedite any required modifications.

Management control of GPD's design projects has been enhanced by the recent installation of the IBM Professional Office System (Profs) software. Among other capabilities, Borgmeyer said, Profs permit executives to obtain a summary of overnight engine testing by 8:15 a.m. the next day, accessible from any of the engineering terminals.

The final release of the engine is not the end of the story. In fact, Borgmeyer said, there is no end to the story. "It takes us approximately as long to design an engine as it did in 1956, but engine technology has grown infinitely more complex. We couldn't begin to solve today's problems with yesterday's computers. Fortunately, our systems have evolved to meet our needs for designing tomorrow's engines."

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Utility Speeds Data Comparison at Indiana Bell

INDIANAPOLIS — Indiana Bell Telephone Co. has replaced its time-consuming manual comparison procedures with a data set file utility that audits system modifications for IBM OS and DOS environments. The switch has resulted in big time and money savings, according to Indiana Bell analyst Carol Wood.

The utility enables member-to-member and directory-to-directory comparisons of OS/VS partitioned data sets. It also directly supports organizations with Vsam and partitioned data sets.

Before Indiana Bell acquired the utility — Comparex, from Software Module Marketing, Inc. in Sacramento, Calif. — "we were comparing our changes to data sets manual-

ly, which took hours. We had clerks who took prints from our previous release and the current release and literally compared byte for byte on the records what we felt was important," Wood said.

"It was a haphazard guess system," she admitted. "Generally, boredom would set in, and the clerks wouldn't catch all the problems that were visible."

In addition, Indiana Bell had an old in-house, user-written compare program that was inadequate for comparing large records and producing clear output. "We felt we did not have an in-house compare program that was sufficient to meet the needs of the users. We installed Comparex and turned it over to the users group,

which thought it was great. Comparex allows the comparison of Vsam files to sequential files; it works, and everyone is happy with it," said Miles Batchelor, an analyst in the software systems support department.

'Strictly User-Friendly'

Wood, who has created her own Clist to use with Comparex, said, "With the Clist I have written, Comparex is strictly user-friendly and available to anyone who needs it. The users don't have to go back to the manual all the time. Questions appear on the screen like 'Do you want to create a data set to be used for Comparex?' or 'Do you want us to prompt you for the responses?'

"The user can answer yes or no, and it will come out and do whatever he wishes. We can compare data sets... we can even ask whether the user is sure these are the two data sets he wants to compare even before he gets into Comparex. It takes maybe four screens of [IBM's] TSO to do all the responses, and then you get the results of the data sets or go back to the tube," Wood said.

"The users are really responsive to this," she continued, "because Comparex will run faster and they can get the results quickly. By bringing output back to a data set, we can send it down and get it printed. The users seem to prefer processing on-line as compared to batch because we have, at best, a three-hour turnaround time for batch jobs."

Wood is also comparing files at record level to ensure that no records are dropped during updating. "We are comparing input files to output files, and Comparex has pointed out some interesting items. For example, in one day, we processed 23,000 records and discovered that seven records on our input file were not on our output file. Comparex has also discovered several fields that were not populated on our input file."

"Another bothersome feature of the other comparison utility that we had was that it printed out only in hexadecimal. For the programmers," Wood said, "this was fine. But for the clerks who are looking at it, they had to know how to read the print. That takes quite a bit of extra time."

Comparex, on the other hand, prints in either hexadecimal (IBM dump format) or alphanumeric display. The product also underscores the fields that are different, Wood said.

"But the biggest benefit we enjoy from using Comparex is the time-saving element. Comparex probably saves me one half hour for every run. But for some of the bigger runs, the savings might even be days," she noted.

AMS Conference Set for May 29

NEW ORLEANS — The Administrative Management Society (AMS) will hold its 65th International Conference at the Marriott Hotel here May 29 through June 1, 1984.

The conference will incorporate the Gulf Coast Computer and Office Show scheduled for the Marriott Exhibition Hall May 29-31.

Open to all management professionals, the three-day meeting will include more than 20 professional development sessions covering various topics such as personnel trends, employee assistance programs, integrating workstations, educating tomorrow's employee and special office technology workshops, AMS said.

The full conference, including meals, costs \$365 for AMS members and \$395 for nonmembers. Without meals, the conference costs \$275 for members and \$299 for nonmembers.

More information is available from AMS, located at Maryland Road, Willow Grove, Pa. 19090.

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Flexibility Cited in Choice

Productivity Aid Boosts Tool Plant's Access Time

LOUISVILLE, Ky. — Application development software has cut down on problems and has speeded up access times for technical specialists at an industrial tool manufacturer here.

Programmers at Vermont American Corp., a \$220 million manufacturer, were having problems getting information from their files with Command Level CICS.

The company's IBM 4341 acted as host for the 20 manufacturing divisions, and each division had IBM 3276 or 3278 terminals and printers on-line daily to Louisville.

Via the terminals, the 20 user divisions accessed the interactive systems, updating files and entering data. There was no key punch, and at night, the batch reports and orders were run. However, all programming was done by the corporate staff.

Everything in CICS

"In the past two or three years, we have written almost everything in-house in Command Level CICS," said Gary Davis, systems and programming manager. "We have good systems and good files, but the problem we ran into was finding a faster way to access these files and turn around information. Going through CICS command level with procedures such as compile, execute and test got to be a headache."

The company was utilizing Cincom Systems, Inc.'s Mantis application development software in some of its user divisions. It provided a stand-alone, minicomputer-like capability that enabled the divisions to store their own files. However, Mantis did not access the system file without an interface. "Nothing is automatic, and we still had to write code," Davis remarked.

Vermont American also looked at a development tool from Pansophic Systems, Inc. named MIS/OL, but felt that using it required too much effort. "With MIS/OL, you're really writing command-level code and then wrapping their code around it to access files," Davis explained.

Vermont American finally decided to go with User File On-Line (UFO), a software productivity tool from Oxford Software Corp. in Hasbrouck Heights, N.J.

"UFO is easy to learn and use, while learning Mantis is really learning another language," Davis explained. "With Mantis, procedures are time consuming, and we still would have to go through testing and debugging. There was no advantage for our programmers. We would have been better off to stay with Command Level CICS since our programmers already knew it."

"With UFO, we're getting more done in less time," he continued, pointing out that with UFO, everything is automatic. He explained that his staff of eight systems analysts and programmers can use UFO to get data from existing files to provide information and to make more of the data contained in the systems accessible to the divisions. In addition, they are developing a new fixed assets program written entirely with UFO.

"Now we're using UFO to retrieve

data. The programmers are getting the information based on what the divisions want, and with UFO they are generating screens and reports." UFO also enables the programmers to access the firm's Total data base. Total is another Cincom product in the Vermont American software environment.

Davis enumerated some other reasons for choosing UFO. "Most of our systems, such as general ledger, accounts payable and so on were purchased packages. But when we decided to add a fixed assets system and started looking around at packages, most were in the \$20,000 to \$30,000 range."

UFO allows Vermont American to write its own applications and make them more applicable to the corporation and to do it more cost-effectively than buying a package, he commented.

"With Command Level CICS, it is a lot more difficult. For example, an application in CICS that would take one week can be done with UFO in one day."

Currently, UFO is being used mainly for enhancing existing systems. Davis pointed out that his staff does a lot of screens and inquiries. "The information is all in place, and with UFO, the staff gets it back fast to the users," he claimed.

"The programmers like UFO. They see its flexibility and all the possibilities."

Davis is enthusiastic about the productivity advantages of UFO and states that the cost would be justified even with only the fixed assets system.

"We're getting more done with the same staff by using UFO. With so many divisions and so many people making requests, there has always been a backlog. Even though there will always be a bit of a backlog, UFO is keeping us more current with requests. When we get ready to develop the new systems, we'll be much faster with UFO."

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Directory Targets Peripherals For IBM 30, 3080, 4300

CHERRY HILL, N.J. — A directory describing more than 430 peripherals and terminals marketed by IBM for its 30, 3080 and 4300 series mainframes has been announced by Data Decisions, Inc.

The directory shows which products attach to which machines and discusses connectability to communications, distributed processing and office automation systems, Data Decisions said.

The report also notes the marketing and production status of every product listed.

The 41-page directory is priced at \$29 from Data Decisions, 20 Brace Road, Cherry Hill, N.J. 08034.

Execs to Present Case Studies In Meeting on Productivity

WASHINGTON, D.C. — Productivity, Inc. will sponsor a three-day conference here Oct. 31 through Nov. 2 that will feature executives from Fortune 1,000 companies presenting case studies on how productivity was improved in their companies.

Among the speakers at the conference, titled "Productivity the American Way —

The Commitment to Excellence," will be Robert Baumann, chairman and chief executive officer (CEO) of Avco Corp.; Adm. Frank C. Collins, director of quality assurance at the Defense Logistics Agency; Roger Hale, president and CEO of Tennant Co.; and Philip Crosby, president of PCA, Inc.

"The purpose of this con-

ference is to tap the tremendous knowledge of these companies and communicate it to participants in such a way that they are able to return to their own firms with the tools they need to institute their own improvement programs," stated Norman Bodek, president of Productivity, Inc.

Conference seminars will address such areas as manufacturing quality and productivity as the key to bottom-line performance, corporate quality and productivity, labor/management cooperation, participative management, Japanese production management and productivity measurement techniques.

Cost of the conference for Productivity members is \$645 and for nonmembers, \$695. More information is available from Productivity through P.O. Box 3457, Stamford, Conn. 06905.

Swearingen To Keynote WIC Seminar

DALLAS — John Swearingen, director of technical services for the U.S. Senate, will keynote the Women in Computing's (WIC) third annual seminar at the Wyndham Hotel here on Nov. 7.

The seminar will include several other data processing professionals speaking on both management and technical ideas and approaches to end-user computing. Management development session speakers will include Sharon Stromberg, director of the supervisory development center for the U.S. Office of Personnel Management; Blair Stephenson, chief executive officer of Pegasus Systems Associates, Inc.; and Linda Roberts of Arco Oil & Gas, Inc.

The cost of attending the seminar is \$70. More information is available from WIC through P.O. Box 741174, Dallas, Texas 75374.

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At Alberta Government Center

Migration, Rapid Growth Caused Backup Woes

CALGARY, Alta. — In 1981, the Calgary Computer Centre of Alberta Government Services was poised for major expansion and was well aware of the dangers inherent in rapid growth.

The center then was doubling in size each year, both in terms of its staff size and the amount of processing handled by its IBM 3033-based shop. At the same time, the center was installing more CPU horsepower and migrating from VSI to MVS/SP3.

In a proposal addressing the potential problems associated with growth, systems analyst Fai Chan described the problem with System Management Facility (SMF) data management at the center. "We now unload SMF data sets up to seven times each day, where we only needed to unload the SMF data about twice each day formerly . . . The volume of data is going to increase, and we will run out of disk space."

One System

To avoid these problems, center technicians began searching for a software management system. Finding only one such product at that time, the center installed SMF Express from Value Computing, Inc.

Within a year, the center was using SMF Express to ensure the integrity and availability of SMF records during the expansion period, as well as to automate what had been a complex, error-prone SMF dumping and archiving procedure.

The product also minimized the consumption of tapes and disk space, despite the surge in the volume of processing work, while improving the reliability and accessibility of the SMF data needed by a growing number of systems analysts for more in-house applications and services.

Experience So Far

Commenting on the center's experience thus far, Chan said, "We used fewer than 20 tapes [for SMF data] all last year, about as many as the site previously used each week."

Chan also said the extra set of backup tapes is no longer needed, thanks to the product's data base. Moreover, with SMF Express, tapes can accumulate the records of multiple SMF data sets.

"There's the security of having two history files, so you never have the problem of losing SMF data," he said. "SMF Express backs up SMF

data automatically, eliminating the need to devote much disk space . . . easing the pressure on disk resources. Otherwise we'd be out of [direct-access storage device] space by now."

Recovery is easier because of the data base, Chan added. All SMF records are continually written on this file. Further, the SMF Express

data base keeps a complete record of each command transaction and its output.

Previous Procedures

According to Susan Palmer, the center's supervisor of customer services, the pre-SMF Express procedures were a horror. "Each day we used to dump the SMF to a disk data set, and on Sunday,

we'd have to take these seven data sets and dump them to a tape. Then, on Monday, we had to run the tape for Thursday through Saturday; then, on Tuesday, we had to run Sunday's SMF tape data set plus Monday's disk data set.

"Predictably," Palmer added, "we lost some SMF records. We'd often run out

of sort space. And month-end processing was a scramble because we had to combine an accumulation of tape data sets and the last day's disk data sets."

Now, however, she said, no manual intervention is required at all. "SMF Express dumps automatically whenever the SMF data set gets filled up."



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Art Museum Moving to New Location, Acquires Turnkey to Catalog Collection

DALLAS — Moving plans may originally have been the motivation behind the Dallas Museum of Art's (DMA) development of a minicomputer-based collection management program, but the turnkey system now serves many museum needs.

The turnkey system, designed primarily to build and store for record-keeping the museum's master files on its collection and to extend research capabilities, was installed to aid the museum's move to a new location four blocks away from its present site. The relocated museum is slated to open Jan. 29.

The computerization effort began in 1982 and utilizes an IBM System/34 computer, which the museum refers to as its Milam system. The software is being developed by Wiloughby Associates of Evanston, Ill., in coordination with Ginger Geyer, assistant curator for special projects for the DMA.

The Milam system features procedures for rapid data entry, a modular approach to installation, three full-bodied subsystems, on-line control, screen displays and selections and three software packages — Move Management, Exhibition Label and Deaccessioning.

The packages are being installed to help manage the collection during the transitional period before the new museum building opens. The Move Management package will pro-

duce packing lists, identification tags and shipping documents during the relocation. The Exhibition Label software will expedite the typesetting of 300 wall labels for new installations. The Deaccessioning package will provide work sheets and legal documents for some basic "housecleaning" prior to the move.

Transition Initiated

To initiate the transition to computerized information storage, the entire collection of the museum, consisting of 8,000 records (objects) of 20 fields each, was entered into the computer. The process took only three man-days. The first project based on this initial data base was an inventory of the collection.

Using computer-printed inventory work sheets, staff members examined each work belonging to the museum. The inventory was created for accountability of the collection to auditors, for location control, to verify existing records and to gain an overview of holdings in order to plan the move to the new building. After inventory data was entered into the computer, the collection was analyzed according to type of object, size and condition. From these statistics the museum was able to solicit bids for the upcoming move, based on concrete information rather than estimations. In addition, through cross-indexing, special information

needed to facilitate the move could be easily developed. This special information included accounts of oversized paintings, sculpture that must be removed by forklift and extremely fragile objects that must only be handled by a conservator.

In addition to the administrative, procurement and research uses of the collection management program, information on the art objects and accompanying records such as artist biographies, donor information, cultural hierarchies and credit-line standards have been entered into the data base. A total of 22 data files containing about 130 fields make up the system, allowing room for expansion. This multifile layout is accessed by a report generator that enables complete searching, sorting and sophisticated formatting. The modular system design enables the minicomputer to function like a large data base management system at a fraction of the hardware and personnel costs, according to the museum.

To manage activities that represent more universal, ongoing museum needs, three Milam subsystems have been designed — Accessioning, Cataloging and Loan Processing. The first subsystem, Accessioning (the acquisition of works), was installed in April. The computer not only produces the bulk of paperwork need for each Acquisition Committee meeting, but serves as an aid in processing new gifts and purchases. The subsystem assigns a unique identifying number to each object and prints the official curatorial file cover sheet, registration card and ID sticker.

The Cataloging subsystem then supplements the amount and quality of data per object. Loan Processing is scheduled for installation in 1984. It will generate additional forms to help process the shipping and receiving of works of art loaned for exhibition.

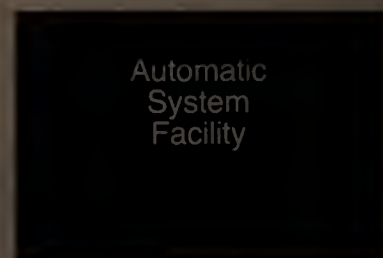
Future applications of the collection management program will be geared toward providing information to the public. Through a screen display, public access for special research projects to files of the museum's collection, sorted by artist or culture, will be available sometime in 1984.

There are plans to supplement this "card catalog" public access system with additional interactive applications that will include a security-sensitive information retrieval program with processing capabilities for public use through terminals in the museum library and education wing. The museum is considering connecting the retrieval program to a laser video disk, offering researchers text plus images of the museum's collection.



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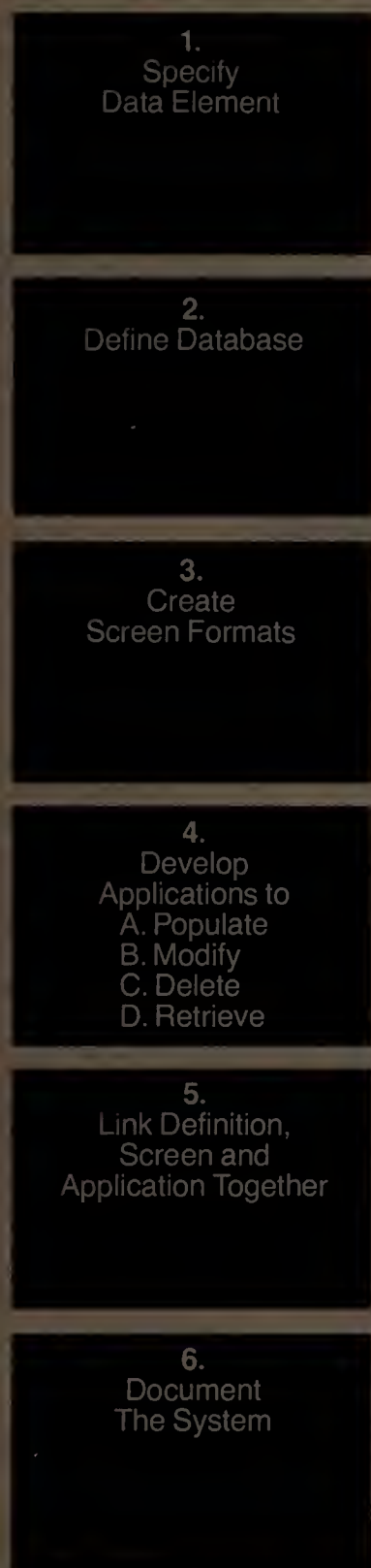
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Thanks to Development System

School System Learns Application Lesson

GRAND RAPIDS, Mich. — With the aid of an application development system, the local public school's administrative computer center here has been able to extend its mainframe's data processing capabilities into new environments and to acquaint students more easily with on-line programming.

According to Mel Pruis, the computer center's technical services manager, his department began looking for an on-line programming editor and a job submission environment about three years ago. "We had 12 programmers at that time," he said, "the junior college enrollment was increasing, and both our admin-

istrative DP and junior college environments had only a single thread for job entry into the system."

The Grand Rapids Schools Administrative Computer Center has five major application systems that serve the Junior College Information System, Public Schools Student Information System, payroll and personnel needs, financial management information and the property tax administration system.

The Junior College Information System supports 9,000 active students. The Public Schools Student Information System maintains data for 35,000 students grades K through 12. The payroll and personnel system

is used by 12 different users, including the public schools. The property tax system, which was developed by local county personnel, is being used by two other counties.

Help Screens

Pruis said his group chose Pan-sophic Systems, Inc.'s O-W-L development system over several other packages because the system provided Help screens allowing beginners to use it by just following the diagnostics.

"This is about the only system that we can give to students which has an on-line Help facility. This means that they don't have to go to a manual for

help. And from my experience, I know that the manuals are often outdated," he asserted.

The mainframe used to run the development system's packages is an IBM 4341 using the OS/VSI operating system. Plans include migrating upward to the VM operating system sometime within the next six months.

Explaining how the development system has increased processing power, Pruis said with O-W-L the computer center can now process 15 concurrent job submissions dedicated to administrative programming as well as 30 concurrent job submissions for the Junior College Learning Center programming instruction. "It has also allowed the junior college to allocate more DP courses within its curriculum," Pruis added.

Pruis claimed a combination of security and control features of O-W-L are uniquely suited to his center's needs. "The user profile feature allows us to control unique access to the system by individual or by groups of programmers. With that feature we can prevent unauthorized viewing of confidential reports, which is particularly important to us in a college environment."

By standardizing the procedures through which a project develops from a test environment to a production environment, Pruis is able to monitor the program migration. He requires all programs being tested to be stored in the production-member data base with the status of "test" or "temp." This allows the programming manager to monitor all programs in that cycle.

In the future, Pruis said, the development system will be used for interactive instruction and testing.

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More information on the program and conference is available from IMC through P.O. Box 34404, Bethesda, Md. 20817.

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Publishing Firm Goes Fourth Generation For Integrated System

By Peter Bartolik
CW Staff

HULL, Que. — To develop a fully integrated, computer-assisted publishing system within a mandatory deadline, a Canadian government project team looked for a fourth-generation development tool.

The publishing center of the federal Department of Supply and Services here decided in 1981 that a completely new computer system was required to keep up with growing demand for government documents and publications. The publishing center's functions — besides marketing, procurement, warehousing, catalog maintenance and order processing — include payments and collections for up to 80,000 customers, inventory control of 50,000 items, shipping of 15,000 orders monthly and maintenance of a 120,000-person subscription base.

In early 1982, the Department of Supply and Services' computer systems branch was handed the task of developing an on-line integrated system for the publishing center. Project manager David Saunders headed the design process that resulted in a system with 200 screens, 900 functional modules, 150 batch processes and more than 80 reports.

"This was not going to be a simple project," Saunders recalled recently. "The solution had to provide a fully integrated system that permitted flexibility, data integrity and ease of use."

Based on prior vendor experience, the department turned to Hewlett-Packard Co. for the system hardware, including an HP 3000 Series 44 processor with 30 user terminals, four slave printers and a minimum of five development terminals.

Under way in March 1982, the project had a mandatory completion date of April 5, 1983. "The schedule was based on the use of fourth-generation development tools to permit a 3,000 man-day project to be completed, tested and implemented on time," Saunders said. "Any delays beyond the beginning of April would be very undesirable, as that is the beginning of the fiscal year."

First Task

The first task was selecting the best support tools. "No one product offered as many desirable features as System/Cop/3000 from Systemhouse Ltd. of Ottawa," Saunders said, noting that

Systemhouse used it for several years as an internal development tool before marketing it.

He characterized the package as a "skeleton system you build on" and said most others required starting from scratch. "We bought it for the security of knowing that it would reduce the chances of a project overrun," he added.

The product, according to Saunders, provided development support through all phases of the project: prototype screens and reports and data dictionary for detail design; Cobol preprocessor, predefined system structure, debugging and testing aids during actual development; tracing and audit trails during testing; and implementation and maintenance aids and others.

Coding began in July, and "we started getting acceptance from the user test team in September," with most coding completed by the end of November. Staff productivity and quality was high, Saunders said.

With incremental testing, the overall structure was tested and approved so most problems were identified and eliminated before any major development had occurred, Saunders said. Retesting the system for correctness and load performance early in the project gave management reassurance that few surprises would occur during the final months of the project.

"The users started training, and familiarization with the system before the last of the code was completed and tested," Saunders said. "The compressed coding phase left time for system testing after the development was finished."

With no major last-minute surprises in the crucial stage, according to Saunders, "The application was operating at full capacity two days after start-up."

While "we have not tabulated all of the results of this project, we are sure that savings of at least 30% in manpower during the development phase alone and other savings were substantial... We were never more than two weeks off schedule," Saunders said.

Saunders said he thought the Systemhouse tool could use some improvement. "About 60% of the program is in Cobol," he said. "What [Systemhouse] has to do is bring it up more to a fourth-generation language."

Supercomputer Conference To Be Held Twice

TORRANCE, Calif. — The Education Foundation of the Data Processing Management Association (EFDPM) is sponsoring a two-day conference on supercomputing Sept. 19-20 at the Sheraton Commander Hotel in Cambridge, Mass. The conference will be repeated Oct. 6-7 at the Howard Johnson's Hotel in Arlington, Va.

The conference will examine the worldwide race for supercomputer supremacy and will focus on government policies and funding, emerging technologies and practical applications of supercomputers.

Featured will be 23 experts from government, industry and education. The conference will focus on technological issues including the limits of gallium arsenide and Josephson Junction circuit designs, the question of whether artificial intelligence techniques are ready to take advantage of the advances in supercomputers and the process of effectively using a supercomputer, the EFDPM said. Defense issues including the supercomputer's role in shaping world defense policies and practical weapons applications will be discussed.

The conference fee is \$499. More information is available from the EFDPM at 3420 Kashiwa St., P.O. Box 3608, Torrance, Calif. 90510.

MEMO

TO: Presidents and CFO's of computer related companies

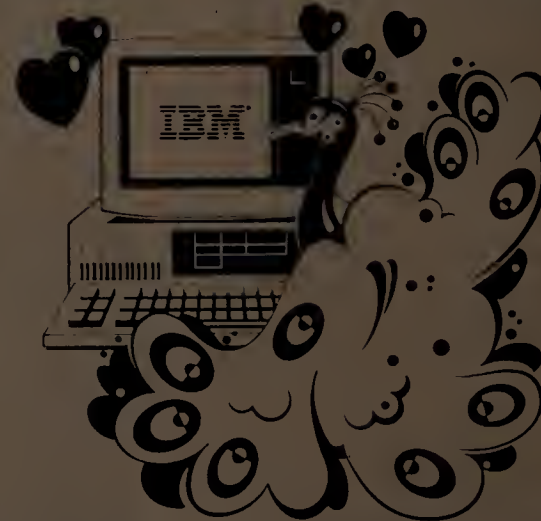
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Package Paves Way for Highway Builder To Cut Equipment, Maintenance Costs

DES MOINES, Iowa — Fast availability of detailed information recently enabled Koss Construction Co., a Des Moines highway contractor, to identify material-hauling trucks that have inadequate durability, high maintenance costs and excessive downtime.

"There is no question that we're holding down job costs now that we get more accurate information weekly," explained Corporate Secretary Richard W. Brown. "In instances where something is out of line, the information now can be reported quickly to someone who can do something about it."

The tool Koss uses is the Interactive Management Accounting Generator (Imag), an on-line, interactive construction software package written by D&S Systems, Inc., Memphis, Tenn. and marketed by D&S and NCR Corp.

One Entry

With Imag, information entered once feeds through to reports on job cost, equipment cost, general ledger and financial statements. Also covered are payroll and related reports, purchasing and accounts payable, accounts receivable, estimat-

ing, subcontractors' reporting and other facets, Brown said.

Koss' hardware includes an NCR 8200 with 40M bytes of disk storage and three CRT terminals. This fall the system will be upgraded to an NCR 9300 with three CRT terminals and an NCR Decision Mate V microcomputer.

Koss builds concrete highways, airport runways, taxiways and similar roads. Headquartered in Des Moines, the company maintains labor forces in Topeka, Kan., and Springfield, Mo., and operates within a 200-mile radius of Kansas City, Mo. Annual volume is around \$20 million.

County Changes

Through necessity, Koss has used computers for many years. Not only do state tax rates vary, but union benefits vary from county to county in Missouri. And there is also a time factor involved related to union contract expiration dates, an "old work, old pay" clause. Thus Koss may pay two different rates on side-by-side jobs in the same Missouri county or see the scale change as work on a road under construction crosses the county line.

"We did our own pro-

gramming from about 1960 to 1979, and toward the end of that period we had two NCR 399 ledger-oriented systems linked to one disk and programmed in Neat," Brown said. "But then we ordered the 8200, faced a major conversion and, with our payroll problems, I figured I would have spent about eight months programming with lots of midnight oil."

To get on-line as quickly and economically as possible, the company selected Imag in June 1979. The conversion was completed in about two weeks, Brown said.

"We went live in July and ran parallel for a month," said Brown. "We had the usual minor programming bugs until September, but soon things settled down. Part of the problems were our own making, too. We had to learn [the Imag] system and NCR's operating system."

Revision System

Since Koss went on Imag, D&S has set up a system in which it will program corrections and revisions from the firm's offices in Memphis directly into the customer's new computer. "We've run smoothly since the early part of 1980," Brown said, "and the NCR hardware has been exceptionally good regarding maintenance. We had one processor failure very early, and since then downtime has

been virtually nil. We're impressed with the ease of operation of both the hardware and the software."

In the past, Koss' job-cost reports were prepared manually by the field office manager, then subsequently on the 399. Now the reports in expanded form, including budget factors, come off the 8200 and are on the president's desk every Monday afternoon, Brown said. Copies go to the general superintendents, field office managers, vice-president and construction engineers.

"This transfers the responsibility for monitoring job costs from the field office manager to the general superintendent who is running the job," he said. "Moreover, the detailed nature of the report tells him if the problem is labor, materials or incidental costs."

"Another benefit is that this approach eases the work load of the field office manager and lets him concentrate on daily production, ordering and receiving materials and the like," he added.

Koss also recently upgraded its payroll input system. Two field offices and headquarters are equipped with facsimile transceivers. Labor information is phoned from the jobs to the field office managers who write the data on up to 5 people on an 8½-by 11-in. form and transmit it to headquarters for processing.

Price/Performance Guide Covers Personal Computers

ROCKVILLE, Md. — "The Personal Computer Price/Performance Guide," a computer printout said to guide the user through "the bewildering maze" of microcomputer system features, capabilities and pricing, will be published by The Management Training Institute in November.

A Price/Performance Indicator (PPI), a numeric indicator based on over 40 features of more than 75 personal computers, was developed for the guide.

The PPI was based upon a theoretical "standard" system with a value of \$2,000 featuring typical specified capacities such as an 8-bit processor, 64K bytes of random-access memory, 256K bytes of floppy disk storage, a 12-in. monochrome monitor, a keyboard with four function keys and a numeric keypad, an institute spokesman said.

Alternative systems were

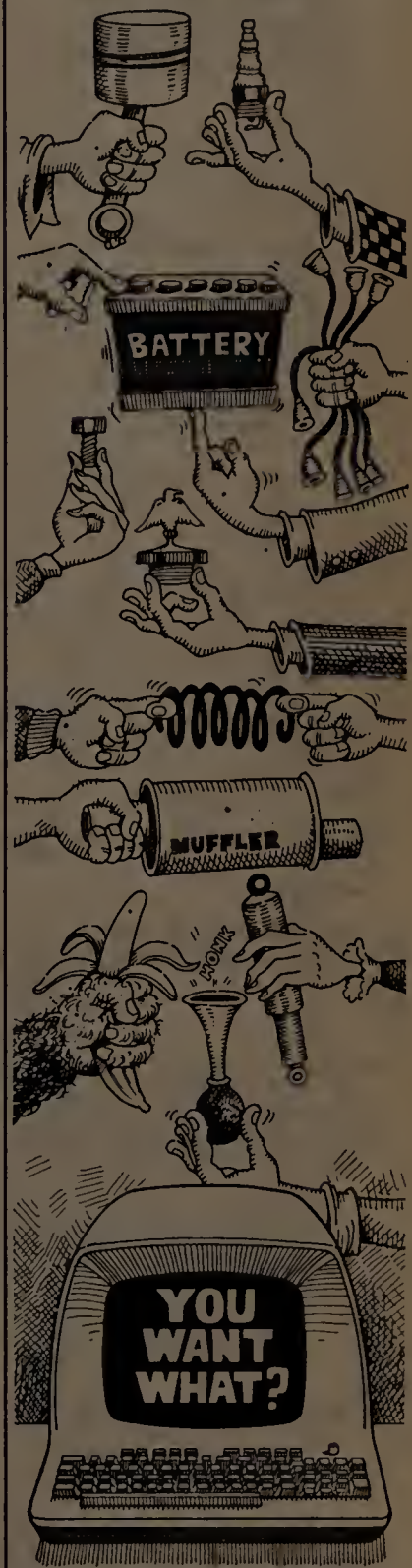
rated against the standard, resulting in a single indicator of price/performance, the institute said.

Business and professional systems have been rated starting with a retail value of approximately \$1,500, the spokesman said.

The publication is comprised primarily of tabular listings with a minimum of descriptive narrative. It is not intended as a substitute for more conventional personal computer directories, but rather as a quantitative supplement, the institute emphasized.

"The Personal Computer Price/Performance Guide" costs \$19.95, plus \$2 for postage and handling. Initial publication will be Nov. 1, the spokesman for the institute said. More information is available from The Management Training Institute, 11317 Old Club Road, Rockville, Md. 20852.

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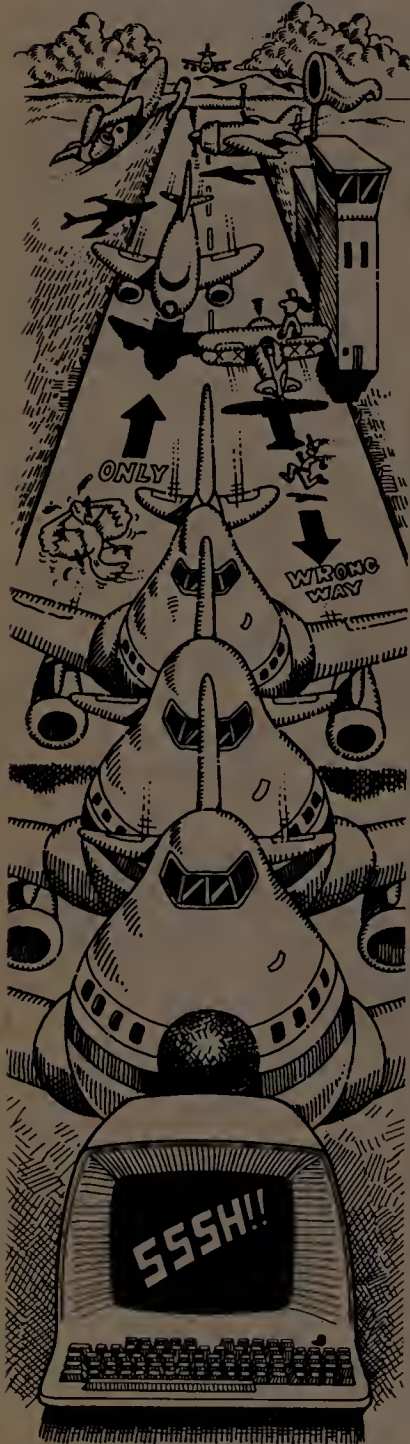
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Communications Net, Software System Help Florists Process Orders and Deliveries

CHICAGO — In the 1960s, Florists' Transworld Delivery (FTD) Association, a cooperative owned by some 19,000 retail florists, tried to develop a capability for centrally processing flower orders. Members of the cooperative wanted an alternative to direct florist-to-florist telephone conversations.

But on-site communications equipment was too expensive for most florists. They continued using phone communications until 1975, when FTD launched another investigation into centralizing flower orders.

The group decided to explore the possibility of implementing a telecommunications network. Bid requests were put out for terminal equipment that could be used in the individual shops.

Terminals Supplied

Based on a successful bid, intelligent terminals with autodial and autoanswer capabilities were supplied by Ford Aerospace and Communications Corp. Another contract for the development and operation of a central processing facility was awarded to Goeken Systems, Inc. of Chicago.

Operating as a service bureau, Goeken subcontracted software development to Chi Corp., which supplied five communications processors and developed software for the processors. The company

also prepared programs for two Sperry Corp. 1100/10 systems, installed by Goeken at the network's headquarters here to provide complete hardware redundancy while serving as the equivalent of a Sperry 1100/12 system.

The telecommunications system is operated by Floral Network, Inc., a wholly owned subsidiary of FTD. Implemented in May of 1979, the Mercury Network initially served 3,000 members — it now serves 9,300 — processing orders and other types of messages.

According to Robert Poirier, director of operations at Floral Network, an integral part of the success of the program has been the use of Sperry's Mapper system, a fourth-generation decision support system for the 1100 systems. Mapper, he said, enables nonprogrammer personnel at computer operations headquarters here to prepare applications programs and produce real-time reports while interacting with current operating data.

A maximum of three days is required to train interactive Mapper users in the manual commands needed to make inquiries or updates and generate ad hoc reports, Poirier said.

"Mapper is enabling us to provide better service to members of our telecommunications network and achieve better control of our internal operations," he said.



To make better use of off-peak capacity, Floral Network uses Sperry Corp.'s Mapper to provide other users with a range of telecommunications and DP services. Seventy-five operator stations like those above are available at off-peak times for telemarketing and other applications.



Floral Network uses Sperry Corp.'s Mapper to maintain history files of network activity for all members of the Mercury Network. In photo above, an employee of the Customer Service Group checks one member's history.

"We use it extensively for member or customer service applications as well as for technical support."

Maintains Files

The Mapper system is used daily to maintain a file of flower orders and other messages and to maintain call files in which every phone call in and out of the system and call dispositions are recorded for instant reference, Poirier added.

Currently, the Mercury Network is used to process more than 5 million flower orders a year, accounting for about 40% of total network volume.

The remaining volume of work that goes on via the network involves a wide range of activity, including credit card transactions, phone-order reporting, billing service transfers and administrative inquiries and messages.

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For Developmental Quality Assurance

Software House Goes Outside for Testing Tool

CINCINNATI — The division for solution software at Cincom Systems, Inc. recently hit on a software solution to cut back on the high cost of testing and retesting programs. It bought a software package from another software vendor.

Two years ago, the Solution Software Division faced growing business demands from its 5,500-client customer base. Those demands came with a corresponding increase in demand for quality testing and support tools in the development area.

In addition, the software firm sought to address the high costs associated with the testing and retesting of programs associated with its growth. To accommodate increased demands and to plan for future growth, John Duckworth, manager of manufacturing systems development, began a search for a productivity tool that would continue to ensure the high quality of released products and which would reduce time spent on developmental testing.

Search Narrowed

The search for a tool narrowed to Tracmacs, a program path auditor designed by Management and Computer Services, Inc. (Macs) of Valley Forge, Pa. Cincom brought in Tracmacs for a 30-day trial period in January 1982.

A team of six programmers was set up to evaluate the results. The evaluation team was headed by Mike Welsh, product assurance manager.

Tracmacs was put to work on different types of modules in the midst of two live projects in an IBM 4341 OS/VS1 operating environment. One project involved a program with 7,000 lines of code ready for final checkout before release. In one section of code having 400 lines of critical date-validation checks,

Tracmacs uncovered five branches that had not been tested under the normal quality assurance preliminary testing procedures, Welsh noted.

Significant Data

Moreover, Welsh said, significant data has been gained from the Tracmacs reports. The Paths Not Taken report,

for example, showed what remained to be tested within a program. Whatever path had not been taken was deemed part of the program not tested. The report also indicated the type of data required to complete a set of test data.

The Sequence report showed how a program processed a particular set of data.

It helped the programmer ensure that paths were taken in the correct sequence.

Commenting on Tracmacs, Welsh said, "We can significantly reduce the number of errors in any batch programs that are produced and effectively tested with the Tracmacs product."

Welsh also found a rapid payback. With computer pro-

cessing time and development man-hour costs at a premium, the reduction of only 25 potential problems in the released products was enough to cost-justify the purchase of the software.

In the future, Cincom will become the beta test site for the OS CICS version of Tracmacs now under development.

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Ansi Seeking Comments On Standard for Graphics

NEW YORK — The American National Standards Institute (Ansi) is seeking comments by Nov. 5 on a draft international standard (DIS) for the Graphics Kernel System (GKS) for programming computer graphics. The purpose of the standard is to permit easy portability of computer graphics programs between installations and to give programmers a better understanding of graphics methods and their uses, according to Ansi, which noted that the standard will also guide graphics equipment manufacturers.

International Standards Organization (ISO)/DIS 7942, Information Processing — GKS — Functional Description provides a basic, user-friendly graphics system that will enable a vast majority of computer graphics users to design portable, device-independent application programs, Ansi said. According to the institute, the GKS gives programmers uniform control of a range of computer graphics equipment — including vector and raster devices, microfilm recorders and storage tube, refresh and color displays.

GKS reportedly provides all the capabilities required for the full spectrum of two-dimensional graphics, from simple passive output to highly interactive applications. Among the capabilities offered by the GKS are dynamic modification of pictures, simultaneous output from various display systems, internal and external storage and retrieval and di-

rect transfer of pictures.

The draft is currently being considered for approval by the ISO, of which Ansi is the U.S. member. A copy of the ISO DIS can be obtained from Ansi's International Sales Department for \$28. Orders should include title, corresponding ISO DIS number and remittance.

Comments on the proposed standard will be sent to the U.S. Technical Advisory Group, which prepares the U.S. positions for the ISO work on information systems. Comments should be forwarded to Daniel W. Smith, Director of Operations, Ansi, 1430 Broadway, New York, N.Y. 10018.

TSI Users' Meet Set for Nashville

NASHVILLE, Tenn. — The 1983 Information Exchange, the annual conference for users of TSI International's product line, will be held here Nov. 7-10. The conference will feature over 60 training sessions, general business meetings, on-line product demonstrations and user forums.

Keynoting this event will be Hugh Sidey, Washington contributing editor of *Time*, commentator for WTOP-TV and radio and participant in the Public Broadcasting System's *Agronsky and Company*.

Registration for The 1983 Information Exchange is \$395. Further details are available from TSI Communications Coordinator Jackie Baio, 187 Danbury Road, Wilton, Conn. 06897.

Videotape Course Aids in 'Visicalc' Use

NEW YORK — A videotape training course designed to help users of Visicorp's Visicalc spreadsheet package increase their productivity has been announced by Legalvision, Inc.

The 90-minute tape covers business applications such as inventories and financial statements. It allows users to utilize Visicalc after one or two sessions with the videotape, Legalvision claimed.

The tape is priced at \$195. More information is available from Legalvision, Suite 2-A, 156 Bank St., New York, N.Y. 10014.

Ansi Committee X.12 to Meet To Discuss Transaction Set Standards

TORONTO — The American National Standards Institute (Ansi) Committee X.12 — Business Data Interchange — will hold subcommittee meetings at the Royal York Hotel here Sept. 27-29 to discuss four key transaction set standards developed by the committee and recently approved by Ansi.

E. F. Fisher, committee vice-chairman and manager of information and DP systems for the 3M Corp., said the meeting has been scheduled to stimulate interest among Canadian organizations for the use of X.12 standard formats for electronic interchange of common business documents. "The use of standard formats to interchange business documents

electronically will benefit organizations in both countries," he added.

All meetings will be open to the public and will begin with an introductory presentation by the X.12 committee at 10 a.m. on Tuesday, Sept. 27. Also under discussion will be Purchase Order Transaction Set, Ansi X.12.1-1983; Invoice Transaction Set, Ansi X.12.2-1983; Data Element Dictionary, Ansi X.12.3-1983; and Application Control Structure, Ansi X.12.4-1983. The committee also has other transaction sets under review.

Copies of standards and further information can be obtained from Ansi, 1430 Broadway, New York, N.Y. 10018.

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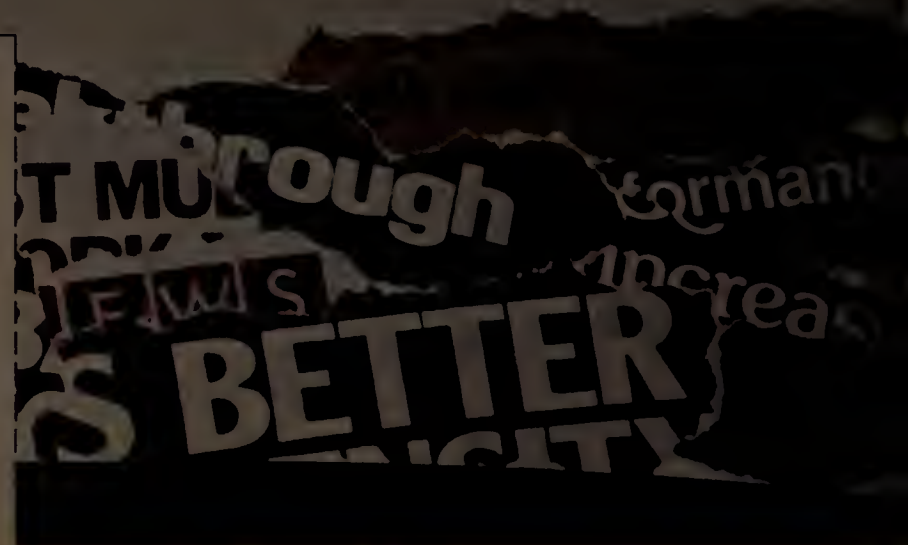
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Reusable Code Writes Finis to Productivity Woes

BOSTON — Reusable code has closed the book on many of the programmer productivity issues that concerned Houghton Mifflin Co., a leading publisher. The company recently reported it has reaped savings of 35% in time and costs with "reusable" software.

Houghton Mifflin's corporate data services department had been using standard program-writing techniques until 1981. At that time the company signed on as a beta test site for Raytheon Computer Services' Ready Code.

"We looked at a number of code generators," commented John Young, Houghton Mifflin's manager of systems and programming. "Ready Code was substantially dif-

ferent from others in that it consists of libraries of reusable program shells with built-in logic. With most other systems, the program still has to provide the update, match and similar functions."

Software reusability is based on identification and isolation of commonly repeated logic structures. On average, these structures make up 60% of the applications, and Houghton Mifflin has found that the shell code generated with Ready Code software can compose 90% of standard report programs, Young said.

The reusable code provides a structured, rigid environment within the application, Young said. "The logic is exactly the same in every ap-

plication developed from the same modules," he said. Because the modules are pretested, the programmer knows exactly where to look when an error occurs.

"Also, because there is less individual programmer manipulation of each program, the need for maintenance due to variations in programmer writing style is decreased, if not completely eliminated," he added.

First Application

The first major application generated at Houghton Mifflin using Ready Code was the royalty accounting system. "This was a massive project since we have to maintain 30,000 separate contracts, with more being added all the time," Young noted.

Because royalty payments are calculated on a sliding scale as a percentage on a book's sales income, exact payments are determined by periodic sales volume. These can be generated only after earned royalty income covers the author's advance and subsequent sales figures have been calculated.

The first stage of the application, which was originally expected to take 60 weeks of writing time, was completed in 21 programmer-weeks. As a result of the time savings the application could be expanded to cover royalties for Houghton Mifflin's four major subsidiaries, Young said.

"We had major restructuring of the way we reported sales figures in this area," Young said. "When this change took place, we had to develop new data files and change all our report formats accordingly. Again, we realized savings of 35% in time and cost using Ready Code."

Marketing support applications are the most complex and time-consuming of Houghton Mifflin's data processing activities, Young said. Reports are generated on a periodic basis, accounting for results by territory, salesman, month, quarter or year and by individual product. These reports are never static.

In addition to an exceptional event like the restructuring of sales territories, there are routine changes in sales staff and the occasional realignment of territory. Whenever this happens, the programs have to restate all history retroactively, a process that Young said is streamlined by the use of reusable software.

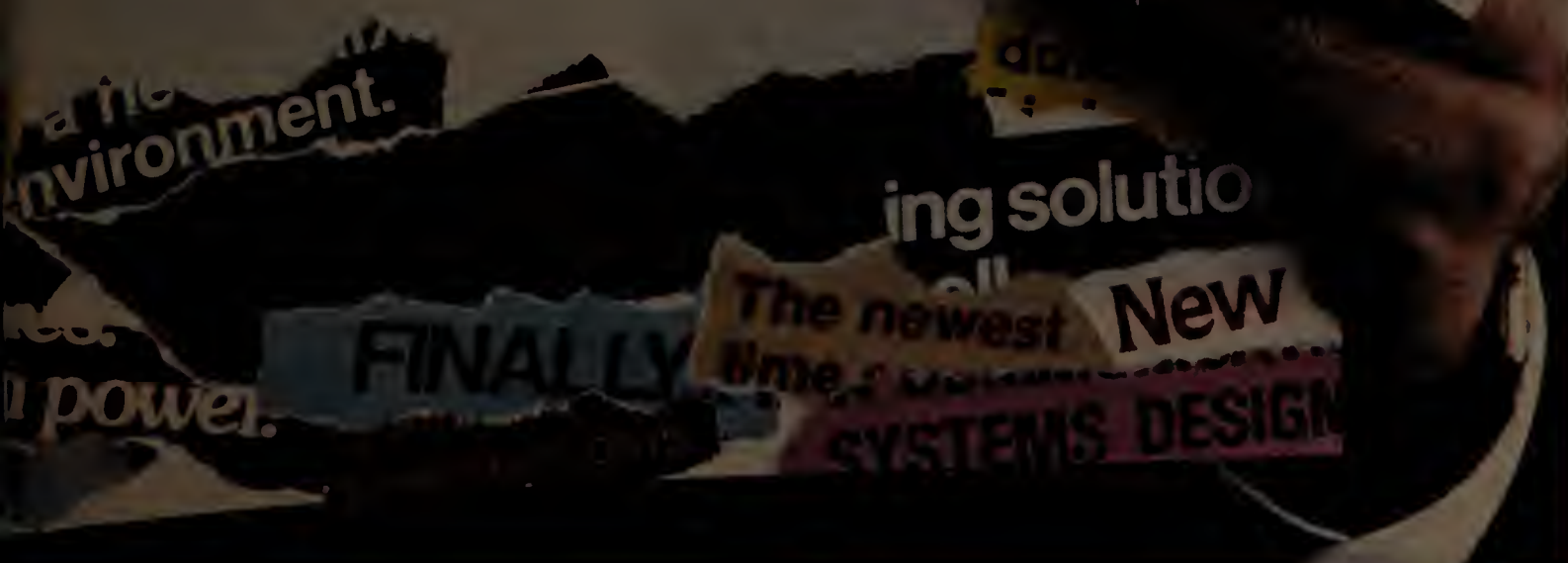
Reusable code has freed programmers and analysts to develop additional applications. Jim Burns, vice-president and director of corporate data services, noted that the company has gone from maintaining about 500 programs in 1976 to controlling an estimated 1,200 programs this year.

One of these new projects has been the expansion of the company's distributed processing network to include a substantial sales order history data base. This has been incorporated within the interactive query facility and is being used in an information center environment, Burns noted. This enables sales and marketing people in the field and in regional offices to access immediately the current inventory status of all Houghton Mifflin books.

Sales and marketing personnel get current pricing and shipping information as well as status on all customer accounts.

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DCA Conference to Stress Fourth-Generation Languages

DANVERS, Mass. — The National Data Base and Fourth-Generation Language Symposium will be held here Dec. 5-8 by Digital Consulting Associates, Inc. (DCA). The conference will stress high-level fourth-generation languages, distributed data base architectures, prototyping, relational data bases and new user-oriented data base management system (DBMS) capabilities.

The first day of the symposium will be an intensive review of data management principles. The next three days will feature 48 one-hour technical presentations on DBMS and application generator

packages.

Lecturers will include Richard Cobb, president of Mathematica Products Group, Inc.; Larry Ellison, president of Oracle, Inc.; Robert Goldman, president of Culinet Software, Inc.; Orland Larson, data base specialist at Hewlett-Packard Co.; and Kenneth Sloan, product manager at Applied Data Research, Inc.

The fee for the four-day symposium is \$750. The fee for the first day only is \$375, according to DCA.

Multiple registration discounts are available from DCA, 339 Salem St., Wakefield, Mass. 01880.

European Local Authority Marks Anniversary of Net

LONDON — Europe's largest local government authority, the Greater London Council (GLC), responsible for the amenities of 7 million people, has passed the first anniversary of its Xerox 8000 network system.

When the Ethernet network was installed in the Scientific Branch of the GLC last year, the department was hard pressed to meet the demands of the various committees. The main task of the GLC Scientific Branch is to monitor and advise on environmental aspects of life in London — the noise levels surrounding one of the world's busiest airports, the water in school and public swim-

ming pools, the exhaust emissions from traffic, the disposal of hazardous materials/chemicals and support for the London Fire Brigade, to cover just some of the aspects of life in a metropolis.

Like all local government offices, the Scientific Branch faced pressures on recruitment and budgets. And, against this background, the demand on the Scientific Branch for information and analysis continued to grow.

"The key benefit to us has been the speed and presentation of reports to committees in the GLC," said Dr. Sam Radcliffe, senior assistant scientific adviser, who introduced the network system to more than 130 staff members in the Scientific Branch. "Before we introduced the Xerox 8000 network system, we had to type up part of each report and then incorporate hand-drawn charts and graphics. Now that we have a professional workstation, we have professional presentations, and this gives us both speed and flexibility."

Within the six-month installation period, the staff members of the Scientific Branch — very few of whom had any keyboard experience — were trained to operate the workstations.

"The electronic mail service is proving beneficial by saving time in circulating documents and getting in touch with colleagues," Radcliffe said. "Also, we are looking forward to the next stage — the linkup with our mainframe computer — to explore new possibilities."

John Carr, chairman of the GLC Staff Committee, which is responsible for computer matters, said, "Reports so far from our scientific staff are encouraging, and the staff fully cooperated in the changeover to the new technology."

"Routine jobs, like report writing and filing, have been streamlined, and the extraordinary speed and efficiency of the new system have freed the staff from many frustrating, time-consuming tasks. Our Scientific Branch is now better equipped than ever to tackle the . . . problems facing London," Carr said.

Canadian Pair Earns U.S. Patent

DOWNSVIEW, Ont. — U.S. Patent No. 4,398,249, issued to Rene Pardo and Remy Landau on Aug. 9, was the first to be awarded to Canadians for the invention of a computer program.

The software reportedly permits a programmed computer to execute its stored program steps nonsequentially, according to Landau.

He originally applied for the patent in 1970, but the decision to issue the patent was contingent on a series of software patent cases heard in both the U.S. Court of Customs and Patent Appeals and the U.S. Supreme Court.

In the last five years, U.S. patents covering software-related inventions have been assigned largely to U.S. companies such as Bell Laboratories and Honeywell, Inc..

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Call for Papers

THE SECOND ASSOCIATION FOR COMPUTING MACHINERY (ACM) CONFERENCE ON OFFICE INFORMATION SYSTEMS, Toronto, June 25-27, 1984.

Sponsored by the ACM Special Interest Group on Office Automation, the conference will address office topics. Original office-related papers that have not been previously published and a few selected papers will appear in the ACM Transactions on Office Information Systems.

Topics appropriate for this conference include, but are not restricted to, the following: communications, technologies, workstation design, distributed systems and services, integrated systems implementation, human and organizational factors and information handling.

Deadline for submission of manuscripts is Nov. 1; notification of acceptance is Feb. 1. The deadline for final camera-ready paper is April 11.

Five copies of papers of up to 5,000 words (20 double-spaced pages) with abstracts should be sent to Dr. Clarence A. Ellis, Xerox Corp., 3333 Coyote Hill Road, Palo Alto, Calif. 94304.

THE SOCIETY FOR COMPUTER SIMULATION, Boston, July 23-25, 1984.

The 1984 Summer Computer Simulation Conference will feature technical papers and is seeking papers on the following: simulation methodology, simulation computer systems, simulation credibility and validation, physical and engineering sciences, systems engineering, chemical sciences, energy systems and resource management, biomedical and life sciences, ecology and the environment, management and the social sciences, training research simulators, government simulation facilities, simulation and computer-aided design/manufacturing and other topics of interest.

Abstracts of 200 to 500 words should be submitted before Nov. 15; after that date, abstracts will be considered as long as time and program space permits. The papers should be classified according to the list of session topics.

Notification of acceptance will be sent by Jan. 15. Complete manuscripts of accepted papers in proper format with finished artwork must be received by March 16.

Only papers that have not been previously published or presented should be submitted. Authors must obtain employer, client or governmental releases prior to submission of the final manuscript. Papers will be published in the conference proceeding, if received by deadline.

Abstracts should be sent to Dr. William D. Wade, P.E., Wade Engineering, P.O. Box 849, Huntington, N.Y.

THE 14th INTERNATIONAL CONFERENCE ON FAULT-TOLERANT COMPUTING (FTCS-14), Orlando, Fla., June 20-24, 1984.

Papers are sought on the following topics: fault-tolerant computer systems, network switching and distribution systems, hardware fault-tolerant design and methodology, dependable software development and recovery techniques, testing and testability, modeling, evaluation, simulation, verification and measurements and new concepts and merging disciplines.

Authors must submit five copies of the paper (double-spaced), which should range in length between 1,000 and 5,000 words. The first page of each paper must include title and subject in-

dex, identified with one of the six topic areas; a maximum 150-word abstract of the paper; and all authors' names, affiliations, completed mailing addresses and telephone numbers.

If there are multiple authors, identify who will present the paper at FTCS-14 in case of acceptance of the paper. The identification should also indicate that the paper has been cleared through the authors' affiliations. A paper lacking any of the above information will not be considered by the program committee for inclusion in the conference program.

Date for receiving all papers and panel proposals is Nov. 18; authors will be notified of the dispositions of their papers on March 7. Camera-ready copies of accepted papers are due April 6. Paper copy of foils or slides for final presentation is due either to the program committee chairman or the session chairman by May 15.

Papers should be submitted to the program committee chairman, Dr. Ben M. Y. Hsiao, IBM, P.O. Box 390, Department D18, Building 707, Poughkeepsie, N.Y. 12602; or to Richard M. Sedmak, Sperry Corp., P.O. Box 500, M.S. C1-SW12, Blue Bell, Pa. 19424.

Free Brochures

• "Crwth CBT News," a newsletter for end users and trainers, has been announced by Crwth Computer Coursewares, a vendor of interactive computer-based training (CBT) for the information center. The newsletter is designed to share information about new developments in the information center, end-user training and CBT course authoring and will also serve as a vehicle to announce new Crwth coursewares.

The first issue of the quarterly publication contains a comparison of IBM mainframe CBT presentation system interfaces and a look at corporate computer skills training.

Future issues will include a "Tech Talk" column, training surveys and authoring tips by Gary Deward Brown, author of various coursewares including "Using SAS" and "Using Focus."

Free subscriptions can be obtained by sending your business card to "Crwth CBT News," c/o Crwth Computer Coursewares, Suite 200, 613 Wilshire Blvd., Santa Monica, Calif. 90401.

• A newsletter named "Signal" for users of Apple Computer, Inc.'s Lisa is created, edited and printed using only a Lisa. Subscriptions to "Signal" are free to any user submitting his Lisa serial number to "Signal," 207 Granada Drive, Aptos, Calif. 95003.



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CPA Cuts Overtime, Expands Services

Turnkey System Eases Tax Season Headaches

BATON ROUGE, La. — A turnkey accounting system has enabled a local certified public accounting (CPA) firm to eliminate overtime, prevent data loss during downtime and expand its services.

CPA Gustavo Gonzalez employs 16 employees in a business that has been growing at the rate of more than 25% per year. In the early 1980 tax season, he and his staff had to work six days a week, often until 10 p.m., in order to complete clients' W2 tax forms just hours before the deadline. Two years later, the forms were finished a full week before the deadline — without overtime and without errors. By 1982, Gonzalez's com-

pany handled 15% to 20% more W2 forms than it had in previous years. "We got them out on time, which is significant, and we knew they were correct, which is even more significant," he said.

The improvement was attributed to the purchase in January 1980 of Timberline Systems, Inc.'s On-Site Professional Accounting System (Opas-1) software, which is distributed by Tymshare, Inc., and business computer hardware from Texas Instruments, Inc.

The system — which includes the TI DS Model 20 CPU with DX10 operating system, 10 TI 911 terminals, three TI Model A10 printers and

Opas-1 — required an investment of approximately \$100,000. Even though Gonzalez had previously used other systems including computers from Burroughs Corp. and NCR Corp. and had also utilized time-sharing services, he found that the TI system offered new opportunities to grow in an era of economic uncertainty and increased rivalry. By using its computer to "work smarter," the firm believes it can successfully compete with larger, nonaccounting companies that are beginning to offer many of the services traditionally supplied by small and medium-size public accounting firms.

In choosing a business computer system, speed and versatility were almost as critical as accuracy. "We've always triple-checked returns, but with this TI system, we didn't have to run them again and again," Gonzalez said.

In addition, Gonzalez no longer worries about losing data. When his previous computer suffered a malfunction or equipment breakdown, data was lost and had to be recreated. The TI computer was designed to prevent such a loss in the event of an equipment problem or power failure. A dual-disk system permits Gonzalez to keep on working even when the occasional peripheral or disk drive problem occurs.

Sophisticated Tax Planning

The turnkey system also offers sophisticated tax planning. Such comprehensive tax planning possibilities are welcomed by Gonzalez, whose previous computer system did not have the hardware capabilities for this kind of software. "I can give you 99 different tax options and print them all out," says Gonzalez. "I can do in a matter of three minutes what would take a good tax man probably eight hours to do."

The turnkey system allows Gonzalez to offer a full spectrum of accounting services, including individual income tax returns prepared in-house. Instead of interviewing the client, filling out the appropriate forms and then waiting for turnaround on an outside computer service, Gonzalez can now receive the information "on Friday and have it on your desk on Monday. We've cut the turnaround time from seven days to two days — without the need for overtime."

Other system benefits include "nonexistent" overtime and the elimination of the use of typewriters thanks to the system's word processing capabilities. The video display terminals are used instead to make corrections, rearrange, edit and print out information in its final form.

Gonzalez has taken the WP potential a step further by using it as a business development tool and as a way to maintain customer loyalty. He uses it to prepare and mail a four-page, tabloid-style newsletter containing tax and management articles of interest, plus a paragraph or two about his firm.

The WP feature is also used to maintain an up-to-date mailing list.

Finally, traditional ledgers and journals are easier to prepare with the appropriate computer hardware and software. Comparative financial statements, for example, have become more of a "fill-in-the-blanks" exercise than a chore in retyping each year's figures.



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The complete set of CapsuleWare programs includes CapsuleWord™ word processing, CapsuleCalc™ calculation & analysis, CapsuleOffice™ portable secretary, CapsuleComm™ communications and CapsuleForm™ forms processing.

Secondly, the Gavilan's primary user interface is not the keyboard, but instead, a built-in pressure-sensitive touch panel that not only selects, but executes, commands. With the full capabilities of a mouse, this simple "point

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and tap" interface all but replaces the keyboard in normal computing operations.

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SAS Users Form Chapter In San Diego, Plan Meet

SAN DIEGO — The first meeting of the San Diego chapter of the Statistical Analysis System (SAS) Users Group is slated for next Monday and Tuesday, Sept. 19-20, at the Rib Cage Restaurant, located across from the Sands Hotel here.

SAS Institute, Inc. is the vendor of SAS, which was first developed at North Carolina State University.

The two-day meet, which will run from 9 a.m. to 3 p.m. both days, will address issues of concern to experienced and first-time SAS users, according to chapter organizer Kirk Lafler, a computer applications consultant. The first day of the meeting will be directed at first-time SAS users, while the following day will focus on technical presentations.

The new chapter has adopted as its objectives providing a forum for exposing and expanding knowledge about SAS, discovering and solving problems and complaints, identifying available sources of training for SAS and providing a means for sharing information from the National SAS Users Group International meetings. This includes recent SAS releases and products.

Another chapter goal is to promote widespread use of SAS within the data processing community, Lafler said.

The registration fee is \$20 for one day and \$30 for both days. Discounts are available for groups of six to 10 people attending from the same installation (\$120 for one day; \$180 for both days).

More information on the meeting is available from Lafler, 2225 Ron Way, San Diego, Calif. 92133.

One-Day, Three-Day Courses

Yourdon to Give Seminars on AI This Fall

NEW YORK — Yourdon, Inc. is presenting in different cities this fall and winter two new courses on artificial intelligence (AI). They include a one-day course called "Executive Review of AI" and a three-day course titled "Planning for AI."

"Executive Review of AI" includes lectures, discussions and demonstrations of AI in the areas of natural lan-

guage, robotics and knowledge-based expert systems. It will discuss how AI can be applied in business and industrial settings and will offer guidelines for embarking on such a program, a spokesman said.

The course will be presented Sept. 26 and Oct. 18 in Boston, Nov. 1 in Los Angeles, Nov. 8 in New York, Nov. 28 in San Francisco and

Dec. 13 in Washington, D.C. It costs \$495 or \$425 if paid in advance.

"Planning for AI" is for managers who evaluate AI and proposes implementation strategies. It covers natural language processing, expert systems and robotics with the goal of providing specific techniques for integration into a DP environment.

The three-day seminar is scheduled for Oct. 19-21 in Boston, Nov. 2-4 in Los Angeles, Nov. 29-Dec. 1 in San Francisco and Dec. 14-16 in Washington, D.C. It costs \$1,195 or \$975 if paid in advance.

More information on the courses is available from Yourdon, 1133 Ave. of the Americas, New York, N.Y. 10036.

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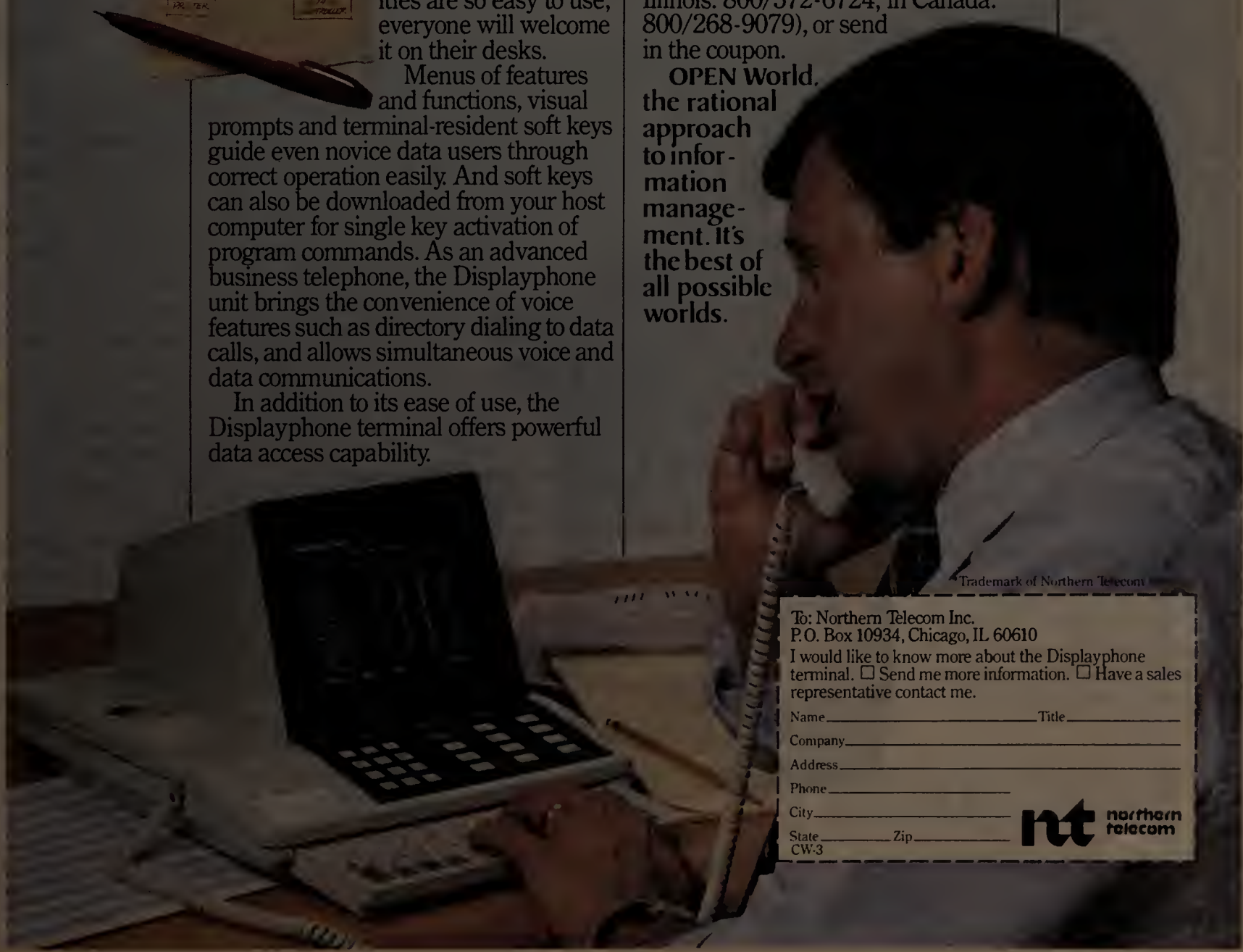
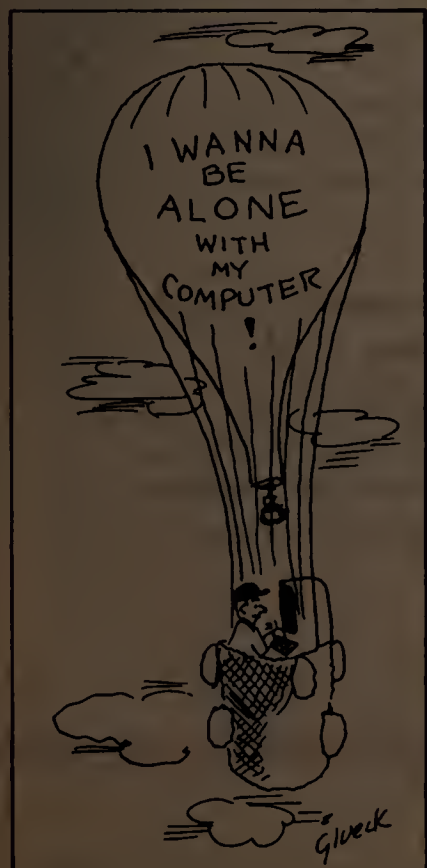
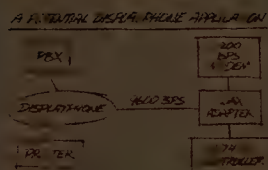
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The COMPAQ Portable runs more programs

The COMPAQ Portable was designed to fit under a standard airline seat so you can take it on business trips.



The unique aluminum frame of the COMPAQ Portable has cross-members that strengthen it front-to-back, side-to-side, and top-to-bottom. It's a design practice commonly used in race cars.

than any other portable. In fact, it runs more than most non-portables. That's because it runs all the popular programs written for the IBM® Personal Computer. There are hundreds of them. They are available in computer stores all over the country, and they run without any modification, right off the shelf.

Imagine the power of a *portable* word processor. There are dozens of different word processing programs available for the COMPAQ Portable.

Planning, problem-solving, and "what-ifs" are a cinch with a variety of popular electronic spreadsheet programs. The COMPAQ Portable runs them all.

There are accounting programs for anything from computerizing your family budget to full-scale professional management of payables, receivables, inventory, and payroll for your company.

There are programs for making charts and programs for communicating with other computers. Or if you want something really specialized, there are even program languages for writing your own programs.

So, you get portability and you don't give

up problem-solving power. The combination adds up to the most useful personal computer on the market today.

Works better because it's easy to read

The display screen of the COMPAQ Portable measures nine inches diagonally. It shows a full "page width" of 80 characters on a line so tasks like word processing are easier. And those characters are big enough to read even if you're leaning back in your chair.

The display shows both high-resolution graphics and easy-to-read, upper- and lowercase characters. One screen



There are hundreds of useful programs for the COMPAQ Portable because it runs all the popular programs written for the IBM.

for all the information. With some personal computers, including the IBM, you can have either the graphics or the legible characters, but you can't have both unless you buy two different displays.

Incidentally, computer prices are often quoted without a display. The display of the COMPAQ Portable is built in, of course.

Add-on options make it work the way you work

Inside the COMPAQ Portable are three open slots. Electronic devices called expansion boards fit those slots and give the COMPAQ Portable new powers.

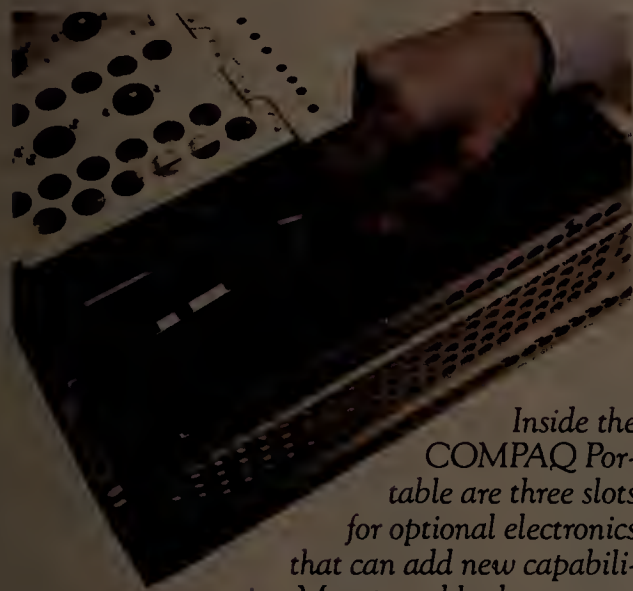


Just like the programs, expansion boards designed for the IBM work with the COMPAQ Portable, so there are dozens available right now. With them, you can make your personal computer more personal.

Want to check a stock price? Or look up something in The New York Times Information Service? One expansion board enables the COMPAQ Portable to handle those communications over ordinary phone lines.

Want to use your company's central computer files while you're on a trip? There are boards that allow the COMPAQ Portable to communicate with a variety of large mainframe computers.

Other boards let you hook up controllers for computer games or increase memory capacity. Still others let you connect personal computers in a network so several people in your office can share the same information.



Inside the COMPAQ Portable are three slots for optional electronics that can add new capabilities. Most portables have none.

Works better because it's tough enough for the road

Portable doesn't just mean smaller. Portable means tough, too.

The COMPAQ Portable was built to withstand the hard knocks of constant travel. An aluminum frame within the case completely surrounds the computer's working components. Each disk drive is mounted in rubber shock absorbers instead of being bolted directly to the frame.

To test internal components, the COMPAQ Portable was subjected to impacts of 40 G's while running a program. After impacts on each side, there was no internal damage and the program was still running. Without error.

Computers are for getting rid of worries, not giving you new ones.

Designed to help you work better, too

The COMPAQ Portable was designed to feel good.

Specifications

Software

- ☐ Runs all the popular programs written for the IBM PC

Memory

- ☐ 128K bytes RAM
- ☐ Expandable to 640K bytes

Storage

- ☐ One 320K-byte minifloppy disk drive, second drive optional

Display

- ☐ 9-inch (diagonal) monochrome screen
- ☐ 25 lines by 80 characters
- ☐ Upper- and lowercase, high-resolution text characters
- ☐ High-resolution graphics

Expansion board slots

- ☐ Three IBM PC-compatible slots

Interfaces

- ☐ Parallel printer interface
- ☐ RGB color monitor interface
- ☐ Composite video monitor interface
- ☐ TV RF modulator interface
- ☐ Communications interface optional

Physical specifications

- ☐ Totally self-contained and portable
- ☐ 20"W x 8 1/2"H x 16"D

The keyboard is detached so it can fit into your most comfortable working position.

The keyboard cable remains connected at all times. So you don't have to unpack it and hook it up every time you use your computer.

Because the display is built in, the COMPAQ Portable makes a neat,

small package on your desk, instead of a big obstacle you have to talk around. The built-in display also avoids the usual cable clutter because there's no need for separate cables for the display.

The COMPAQ Portable even has an electronically synthesized sound to create the familiar keyclick of a typewriter. With a simple keyboard command you can adjust the volume to suit the level of background noise in your office.

The added usefulness is free

The COMPAQ Portable can do what desktop computers do and do it in more places. But it doesn't cost any more than an ordinary desktop.

In fact, it costs hundreds less than a comparably equipped IBM or Apple® III. The COMPAQ Portable comes standard with one disk drive and 128K bytes of memory, both of which are usually extra-cost options. A second disk drive and additional memory are available to make your COMPAQ Portable even more powerful.

The bottom line is this—you just can't buy a more practical, useful, productive computer. Before you decide on a computer, you owe it to yourself to compare the COMPAQ Portable.

For the location of the Authorized Dealer nearest you, call 1-800-231-9966.

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User Cures Batch Run Documentation Woes

KANSAS CITY, Mo. — Two years ago, batch run documentation at Farmland Industries here was plagued by a number of problems. Like many shops, Farmland had paper run books — one for each of its 2,300 batch jobs — created by hand.

As a result, run documentation was tedious to maintain. Lack of coordination was an issue because there was no guarantee that changes to procedures or to job control language (JCL) would be reflected in the run documentation, according to Dave Calvin, systems programmer.

Some jobs were undocumented, and uniformity was a problem because the format of run books had

changed. Other jobs were out of production, but the run books lingered on, Calvin said. Sections were missing from other run books, and there was no automated way to verify data.

Automated Run Documentation

Farmland Industries saw a need to automate its run documentation. A special interdepartmental team dubbed the Performance Upgrade Project (PUP) was formed based on the recommendation of a task force of data processing division supervisors and managers. The PUP team was comprised of individuals from operations, scheduling, programming and systems support.

The PUP team determined that a good documentation system should be:

- Easy to create and maintain. It should be available through IBM's TSO software.
- Coordinated. There should be only one source for documentation.
- Complete. All production batch jobs should be documented.
- Uniform. Screens should be formatted.
- Current. Any change to JCL should automatically update documentation.
- Consistent. All needed information should be available.
- Enforceable. Any documenta-

tion change should go through existing change control procedures.

To meet these specifications, the apparent solution was an automated, user-friendly, JCL-driven system that met the needs of each department: scheduling, operations, system support, tape library, distribution, data base administration and programming. All run documentation would be created and maintained via TSO with a backup copy on microfiche.

However, the PUP team quickly realized two main obstacles to introducing the new order: The execution JCL was on 80-col cards, and the required flowcharts were hand drawn.

The first obstacle was overcome when the execution JCL was loaded to disk, and Calvin wrote an in-house job submission system. The second obstacle was overcome when Farmland purchased the Structure(s) package from Ken Orr & Associates, Inc., and the PUP team coupled it with its In-Out Diagram generator programs.

The In-Out Diagram is a system design tool that identifies inputs and outputs of each function or program in a system. It automatically parses JCL code and generates structured code.

The Structure(s) documentation package is used primarily as a system and program design tool. It produces formatted, readable, cross-referenced Warnier/Orr diagrams, Calvin said.

The PUP team saw JCL as something an In-Out Diagram could graphically represent. Just as data is either used or created by a program, data sets are either input to or output from a procedure step. Using JCL as input, the programs created by the PUP team analyze the job control parameters and create instructions for Structure(s). Structure(s) then uses these instructions to create an In-Out Diagram.

The In-Out Diagram contains many of the same elements as a hand-drawn flowchart: job name, program name, job step name, procedure name, procedure step name, data definition name, data set name, unit type, disposition, space parameters and program sequence. Unlike the flowchart, it automatically cross-references all those elements, creates an index that shows the location of each element in the diagram and indicates where each data set is created as output and used again as input, Calvin said.

By automating the flowchart creation process, the PUP team could guarantee, once a change was made to the JCL, that an accurate picture of data flow could be generated by simply running the updated JCL through the diagram-generator programs.

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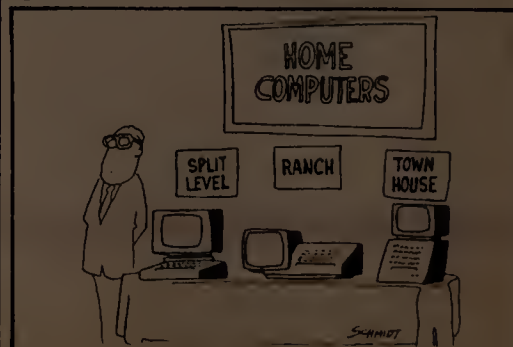


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CAR System Ensures Money Savings for Aetna

HARTFORD, Conn. — By using a computer-assisted retrieval (CAR) system to manage a 180,000-policy file in its Assigned Risk processing group, a major insurance company here saved more than \$500,000 over a three-year period.

Before it had the CAR system, Aetna Insurance Co.'s Assigned Risk processing department was using an on-line teleprocessing system to rate and issue policies. However, when it came to processing policy changes, looking up invoicing, payment and other day-to-day information, that information had to be retrieved from a policy file made up of 1.2 million pieces of paper.

Twenty people who worked in the records area filed roughly 4,000 pieces of paper and pulled between 600 and 700 files daily. Statistics showed there was a 17% out-of-file or nonavailability condition, which only wasted clerical workers' time with fruitless searches.

The first attempt at managing the file with microfilm was with microfilm jackets. While this resulted in reducing physical space, the jackets

still had to be retrieved manually and refiled.

According to Andrew Hoffman, an administrator for Aetna, the major problem with jackets was that they were labor-intensive. He concluded the company could accomplish more with fewer workers by providing them with a computer-assisted retrieval system.

In adopting a CAR system, Hoffman said the company had to select a system that would work either on the company's mainframe computers or on a stand-alone minicomputer.

"There were drawbacks to mainframe systems," Hoffman explained. "The first was that few packaged systems were transportable to our equipment and many did not sufficiently meet our needs.

"Another key question was whether we wanted to tie up the mainframe with file maintenance and retrieval data. Our feeling was that the mainframes were better suited to number crunching and high-volume operations," he explained.

Hoffman said a third strike against connecting the CAR system to the

company's mainframes was the possibility of the system going down, which meant losing all file maintenance and processing functions.

Complete Turnkey Required

In light of these three liabilities, the company decided to hook its CAR system up to a dedicated 16-bit minicomputer. However, the company would accept nothing less than a complete turnkey minicomputer system made up of the processor, software, retrieval units and microfilmers and support that could be provided by one vendor.

The firm decided to go with Eastman Kodak Co.'s KAR-4000 system, which it said is capable of storing and recalling summary data about each document and retaining the individual location for each document in the micro-image file.

The system has cut down the number of retrievals from an average of 700 a day to less than 200, according to Hoffmann. Retrieval time has also been significantly reduced, he noted. Instead of a minimum lag time of two hours between request and delivery of a file to the requestor, retrievals now can be made in two minutes, he added.

Another benefit of the system is the floor space it frees up. Hoffman said the CAR system occupies 1,000 square feet of floor space compared with the 4,300 square feet taken up by the 180,000-policy file.

In terms of personnel savings, the two-shift, 20-person staff has been reduced to a single five-person shift. When added up, the space and personnel savings result in a 52% savings in the Assigned Risk processing center's budget.

Approximately 80% of the inquiries can be answered from information contained in the data base, a company spokesman noted. The remaining cases require document images. In these instances, the company uses terminals that are on-line to the

minicomputer.

When an operator uses a terminal to inquire about a document, the computer automatically keeps the microfilm roll-and-frame number location available.

If the document is required, the operator simply inserts the proper microfilm into the terminal and lets the computer control the search. After the terminal reaches the desired document, it automatically stops and displays the image on its screen, the company said.

In addition to microfilming, the system's microfilmer exposes an image control mark along the edge of the microfilm under each document image and stamps a sequential number on each document.



Workstations with both computer and micrographics terminals will be installed in three user areas. Each area will handle the policies for one state.

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Newspapers, Encyclopedias

Data Base Service Puts Library on Desktops

DAYTON, Ohio — Electronic research services are bringing vast libraries to the desktop terminal.

The desktop computer terminal brings users of Mead Data Central's (MDC) Nexis and Lexis, the *Encyclopedia Britannica*, *The Washington Post*,

major magazines, wire service stories, newsletters, the Federal Register, Supreme Court decisions, the Internal Revenue Code, case law from all 50 states, corporate annual reports, Securities and Exchange Commission reports and various other information, all within minutes or even seconds.

Nexis, the news and financial information, and Lexis, the legal data retrieval, are extensive electronic libraries accessed through customized time-sharing terminals connected to a computer facility at MDC located here.

MDC devised a data processing system that can search and retrieve

the full text of information in an interactive dialogue with the user — around the clock, nationwide as well as in the United Kingdom and France.

Other data retrieval services have shied away from this full-text approach by structuring data bases more narrowly. They provide an index or abstract as the first step in locating information. MDC eliminates this step and enables the user to search and browse all or part of the materials directly, an MDC spokesman said.

The company has assembled massive on-line data bases of complete texts stored primarily on Memorex

Corp. disk drive systems and equivalent to about 200 years of reading — more than 32 billion characters of data. The supply continues to grow as MDC adds new publications and legal materials to its disk storage arsenal.

The brains of this service are in the Mead Data Computer Center, where two large-scale Amdahl Corp. computers are connected to an extensive array of state-of-the-art random-access disk memory systems. Most of the disk equipment consists of Memorex Corp. 3652s, 3655s and 3656s.

Lexis and Nexis can be compared to libraries with high-speed research
(Continued on Page 78)

Assassins, Charity Found in Data

DAYTON, Ohio — The following are two examples of how Mead Data Central's (MDC) Nexis and Lexis terminals allowed users to access information they needed from MDC's public data base system here.

Last year, when Pope John Paul II was shot in Italy, the name of the attacker was announced, but little else was known about him. A reporter in San Francisco entered the alleged assassin's name into the Nexis terminal and, within minutes, retrieved six background news articles that had mentioned his name.

The system first gave the journalist a list of publications and stories that were requested. Then, it provided excerpts referring to the assassin. And finally, the reporter asked for printouts of the articles in full. That night, an in-depth report on the attacker appeared on the television news, according to an MDC spokesman.

Broader subject areas usually mean more complex computer detective work. For example, a corporation was thinking of donating an academic chair in economics to a local university.

Since the chair was to be devoted to the study of the free enterprise system, the corporate public affairs manager wanted to find out whether other companies had made similar gifts and, if so, how they had been received. Did the universities accept? How did the media treat such gifts? Would there be criticism?

Within minutes, and without leaving the office, the manager let the system do his homework by using a display format called Key Word in Context, an MDC spokesman said.

Instead of having to sift through indexes under such listings as "universities," "corporate gifts," "economics" or "academic chairs," the manager came up with some key words that would be likely to appear near one another in an article or report dealing with the subject.

Wherever these words appeared together, the disk drives located the story or article containing these words. The speed of the response, frequently 15 seconds or less, is based to a large extent on the read and retrieve speed of the disk memory devices. The information received was positive, and the university accepted the corporation's gift, an MDC spokesman said.



POWER SYSTEMS FOR COMPUTERS

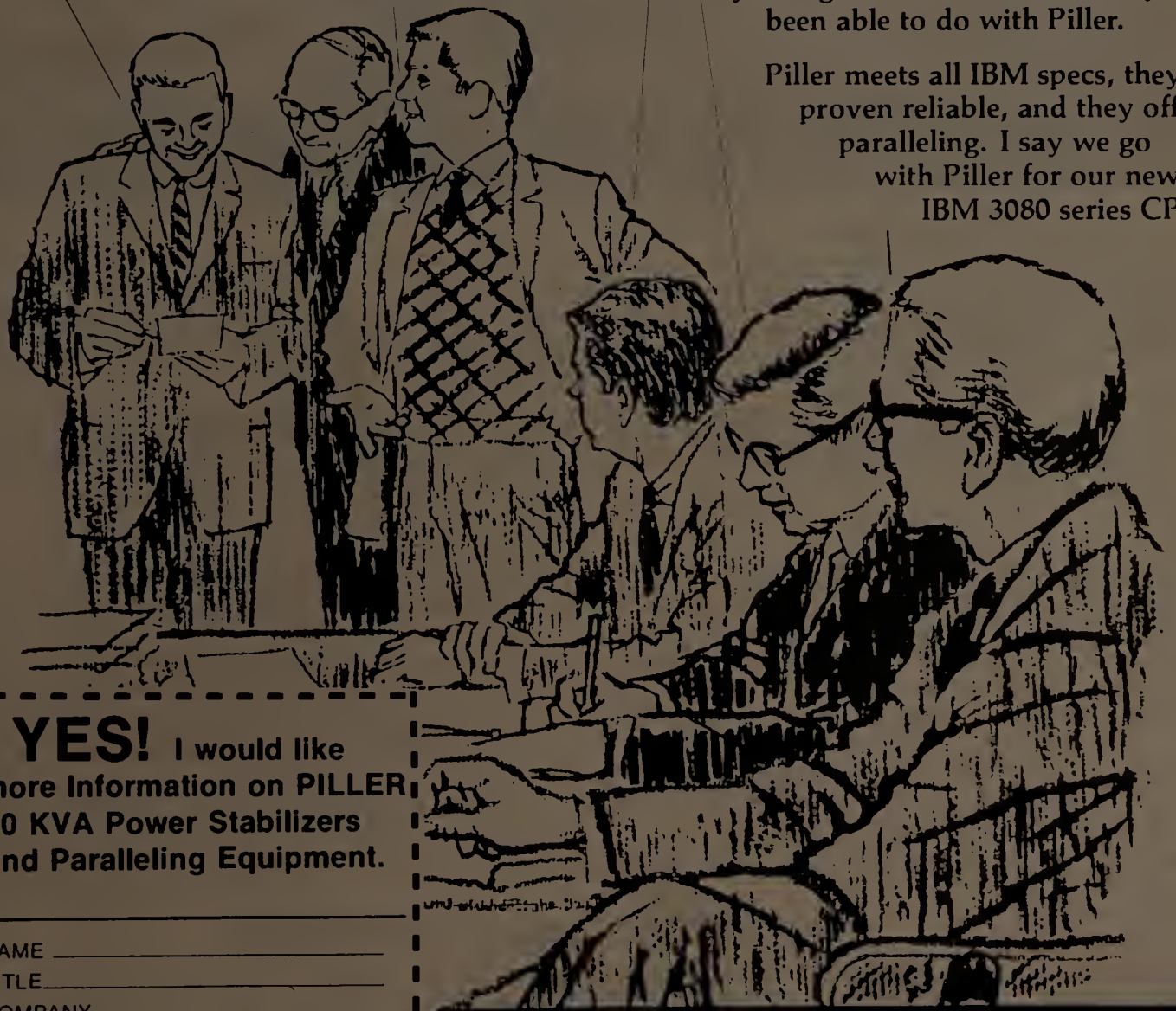
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On-Line Service Puts Library in Terminal

(Continued from Page 77)
personnel. Instead of going to the library, you turn on the desktop terminal. Instead of searching the card catalog or indexes, customers enter the word, phrase or combination of words and phrases to describe their information needs.

"The key customers of MDC's system depend on using it every day to assist them in running their busi-

ness, so our key concerns in setting up our system have been reliability, prompt response and cost-effective delivery," noted Bruce Rhoades, MDC's vice-president of systems and operations.

It took years to perfect the software; now the burden of consistent performance rests on both software and hardware, according to Rhoades.

The configuration is fully

redundant. All of the disk drive units are connected to both of the computer mainframes so that there are at least two paths to each storage unit. Moreover, all of MDC's disk drive systems incorporate a unique option called Intelligent Dual Interface (IDI).

With the built-in redundancy of IDI, each spindle in the disk drive has two independent access paths for op-

timal throughput. It also means the equipment can be serviced without shutdown — each spindle can be diagnosed and repaired while all of the others continue to operate.

The disks are dual density to maximize the amount of information that can be stored. The more densely packed the data, the less time required to scan and identify relevant texts.

To back up this configuration further, MDC provides three levels of security. First, a complete copy of all the information is stored on tape in the computer center. Then a second complete tape copy is kept at a separate location nearby. And for further protection, a third full set is located in another facility located in a different geographic region, the MDC spokesman said.

MDC's Nexis and Lexis services respond to more than 25,000 search requests per day — that's an average of more than 1,000 transactions per hour — and the number is rising as more law firms, corporations, broadcasters, advertising and public relations agencies, unions, government agencies, political organizations and others subscribe.

MDC decided to enable each user to find exactly what he is interested in, regardless of how rare, specific, vague or technical that subject might be.

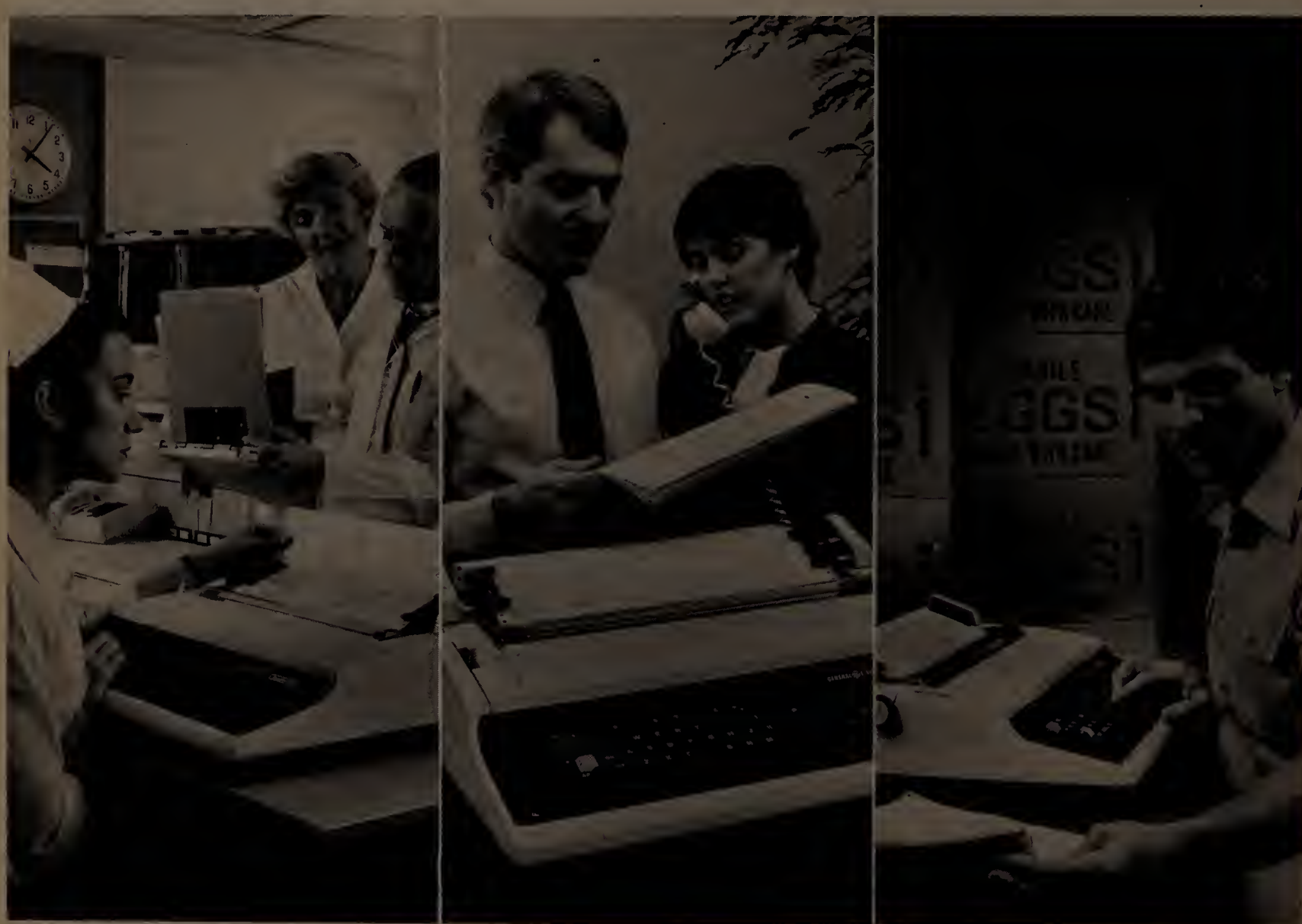
And to implement this flexibility, it designed its own sophisticated programs. The company also customized special user-friendly terminals and installed high throughput, dual-density disk memory systems to store much of this data. This integrated service responds reliably and quickly even during peak periods each day, the MDC spokesman said.

With the current software and the hardware base, the MDC system can expand relatively easily, using the same technology in any number of new information areas. MDC has already placed the French and British legal systems on disk.

Meanwhile, Nexis is increasing the range of publications covered, and Rhoades pointed out that there are new possibilities in the offing.

One such venture, a joint project of MDC and the Associated Press, offers up-to-the-minute information on candidates and issues in elections. It targets information on the candidates, their backgrounds, positions, endorsements and events.

By taking the tedium out of information gathering, MDC's computer system is giving its users more time to do what computers still cannot do — think, Rhoades said.



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Processes Design Information

Supermini Keeps Firm's Hydrofoils Above Water

RENTON, Wash. — It is no surprise that computers used for accounting and inventory do a lot to keep a company afloat financially. However, a firm here is using these same computers to keep its product actually above water.

Boeing Marine Systems (BMS) in Renton, Wash., the world's leading producer of fully wetted hydrofoil boats, uses a superminicomputer system to move administration and design information back and forth between computers within its organization. No small feat considering the company is a division of the internationally known airplane manufacturer and has been developing and selling commercial hydrofoils since 1973.

Guided by an automatic flight system similar to that found in Boeing airplanes, the hydrofoil "flies" over water. Boeing hydrofoils are capable of navigating in waves as high as 18 feet and have been sold for purposes as diverse as fisheries protection and patrol and passenger ferries.

Because its most lucrative markets depend on water-based economies (Hong Kong, the English Channel, the Canary Islands, the Sea of Japan), BMS finds itself dealing with combinations of corporate, municipal, national and quasi-governmental agencies. Thus, the ability to transpose information from one type of document to another is an essential part of the BMS success story.

High Error Rate

Also, the company was plagued by a high error rate as clerical staff had to enter repetitive data onto a series of forms for each transaction or bid proposal. Numerical inversions were especially troublesome, requiring the staff to check and double-check every entry.

To handle these problems, BMS installed a Wang Laboratories, Inc. VS system in 1979. "Wang's editing capability, which allows us to move information back and forth between computers, is a really powerful way of doing lots of jobs. It was that capability that attracted us to Wang in the first place — that and user friendliness," maintained Homer Smith, computer services manager for BMS.

Following installation of the Wang system — which includes two VS computers, three word processors and 32 terminals — errors were cut by 95%. Explaining the cost-effectiveness of the system, Smith estimates that the equipment paid for itself in a single year by reducing errors and facilitating other productivity improvements. For example, within three months after learning operating techniques, documentation clerks' productivity had doubled. Since clerks knew they could correct errors in entries and rough drafts, typing speeds and accuracy increased, sometimes by as much as 90 words a minute.

The company was also concerned about computer applications for casual users who might need an information system only once a month or less. The Wang system, which leads the user through a program, has been very appealing to these employees.

As a result, engineers, planners and others use the machine to edit draft material, Smith said. "They don't rely so much on the word processor operators, which has resulted in tremendous time savings."

Another function that Wang automated — translating cost estimates based on 1976 dollars into 1983 figures — has reduced to 15 seconds a single task that once required an hour and a half. "In just the engineering release unit alone," Smith said, "we figure it would take 111 people to do the same job that 17 are now performing. We could no longer do everything manually."

The Wang VS is tied to mainframe

computers in the Boeing computer system center. The system's ability to interface directly with other computers has increased company responsiveness to customer needs. Smith estimates that the second highest usage of the equipment is in the accounts payable and purchase order system.

A purchase order entry automatically pays the account by releasing a message to send a check for payment. Payment in this manner takes advantage of discounts for early payment. Again, the number of slipups has been reduced dramatically. "We're on a machine-to-machine basis now," Smith said, "and the chances for error are much smaller."

Most important, without its complete computer system, BMS could not build hydrofoils. Boat configurations, structural and parts analysis and inventory are all stored within the system, ready for use at the touch of a finger.

"You can't have a lot of parts on the boat because weight is so critical," Smith explained. "A lot of it is produced by automated machine tools, aluminum castings and machining. Without the capability of analyzing all the factors — performance, structure and so on — you couldn't build one. And you can no longer afford to do that kind of analysis by hand."

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Dataproducts probably knows more about the people who use computer printers than anybody. We know how they slam cabinets. How

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The best printers are the least expensive to own.

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And because we make so many of these printers, we don't have to charge a lot of money for yours. You get low initial cost. And low cost of ownership.

If you'd like to know more about our B-Series printers, or the name of our distributor in your area, call (213) 887-3924. Or send the coupon below.

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So the chances are pretty good that your own programming effort can be trimmed substantially. When you do need to write your own programs, the HP 3000 will help you do it much faster. With our special set of programming tools, customers have cut 500 lines of code down to 100. At about \$50 a line, that really adds up.

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If you'd like to see how useful an HP 3000 can be, call your nearest HP sales office listed in the white pages. Ask a Business Computer Specialist for a demonstration. Or write for more

information to Tom Rappath, Hewlett-Packard, Dept. 03184, 19447 Pruneridge Avenue, Cupertino, CA 95014. In Europe, write to Henk van Lammeren, Hewlett-Packard Nederland B.V., Dept. 03184, P.O. Box 529, 1180 AM, Amstelveen, The Netherlands.



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Center Opens Tech Window to Third World

PARIS — No matter how far technology advances, it is useless without the concurrent development of human talent.

Beliefs such as this make up the foundation on which the World Center for Computers and Human Resources was built here a little over a year ago.

Geared toward the poor, the jobless and Third World countries, the World Center

provides these people with an opportunity to learn about the high technology that is so readily accessible to others.

Not only will underprivileged people be given a chance to catch up with the harried pace high technology has set for the rest of the world, but the center plans to develop computer applications for such things as medical diagnosis of leprosy, mal-

nutrition and tuberculosis. The center also plans to use voice recognition, speech synthesis and artificial intelligence to teach illiterate farmers or tradesmen about the latest innovations to help them in their work.

'Disseminate Information'

"Our job is to democratize the use of information and to disseminate information, to explore not only the poten-

tial of computer technologies, but also the potential of each individual," wrote the center's president, Jean-Jacques Servan-Schreiber, a French politician and journalist, whose book *The World Challenge* inspired the center.

The center maintains a Digital Equipment Corp. 2060 mainframe, donated by DEC, and a DEC VAX-11/780 minicomputer linked to about 100 terminals. The

center also has about 100 microcomputers for its research scientists and the general public. Open seven days a week, the center is available to anyone who wants to walk in and learn to use a microcomputer.

Similar centers have been opened at Carnegie-Mellon University in Pittsburgh, Pa., and in Tsukuba, Japan, with plans for centers in Colombia and Canada. Pilot projects are under way in Senegal and Saudi Arabia.

Dr. Raj Reddy, scientific director of the center and director of Carnegie-Mellon's Robotics Institute, laid out the concerns of the center as follows:

- To disseminate information through "teams" of exchange apprentices to different countries.
- To conduct social experiments and establish a communications network.
- To study the communication between humans and machines.
- To conduct research on artificial intelligence and computer applications for agriculture and medicine.

'All Kinds of Knowledge'

"Direct and intimate contact of men, women and children with the computer has shown that we can use this unique instrument in all kinds of knowledge," Reddy explained.

"In order for this to take place, we have to have the right tools."

Perhaps most revealing of the center's philosophy is the quotation prominently displayed on the brochure's cover from the 20th-century philosopher Jean Paul Sartre: "That which we understand becomes a part of us."

Coding Standard Offered in Guide

ESTILL SPRINGS, Tenn. — A uniform coding standard that can be applied as written or tailored to establish a company's programming practices has been announced by Associated Technology, Inc.

The 62-page guide covers documentation and coding practices for Cobol, Fortran and Basic. Examples are given that show how early versions of these languages can be made to meet modern programming rules.

The coding standard includes examples that can aid programmers, analysts, quality-assurance personnel, software designers and configuration managers.

Priced at \$23, the guide will be distributed by Associated Technology, Rt. 2, Box 448, Estill Springs, Tenn. 37330.



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212A/D — Identical to the 212A, with automatic dialing capability added! The unit stores and dials up to five 30-digit numbers. CRT menu prompting, single-stroke commands and automatic test capabilities are provided. The 212A/D is direct-connect certified.

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A Few Shortened Words

Are you confused by the alphabet soup of acronyms that pervade the computer community?

It seems that the industry thrives on acronyms, to the point where they at times become less than what they are supposed to be, namely a succinct way of stating what would otherwise be a mouthful.

The following partial list of acronyms and their definitions is intended to put this ever-increasing store of confusing information in perspective. The list was compiled in great part by David Straayer, a systems engineer at Tektronix, Inc. of Wilsonville, Ore.

ACM: Association for Computing Machinery. The world's largest professional organization for computer scientists, engineers and technologists.

Adapso: Association of Data Processing Service Organizations, Inc. The Washington, D.C.-based mouthpiece of the independent software and service companies.

Afips: American Federation of Information Processing Societies, Inc. Among many other things, Afips is the chief sponsor of the National Computer Conference.

Ansi: American National Standards Institute. Once known as the American Standards Association, this group is the primary standards-making adopting body in the U.S. and is the U.S. representative to the International Standards Organization.

CAD/CAM: Computer-Aided Design and Manufacturing. The technology of using computers to aid in the design process and later to integrate the results of the design into

manufacturing. This technology relies heavily on computer graphics.

Cbema: Computer and Business Equipment Manufacturers of America. This organization is the secretariat for Ansi X3.

CDLA: Computer Dealers and Lessors Association. This 2,000-member group advocates for the third-party computer dealers.

Core: The Core report of ACM Siggraph Graphics Standards Planning Committee was a "straw-man" proposal for a computer graphics standard. It was never formally adopted as a standard.

DIN: Deutsches Institut fur Normung. The official standards-making body of the German Federal Republic (West Germany). This group wrote the first versions of the Graphical Kernel System.

DPMA: Data Processing Management Association. The voice of the U.S. data processing manager.

GKS: Graphical Kernel System. A proposed two-dimensional software standard for computer graphics originally developed in Germany and now being adopted internationally by the International Standards Organization and in the U.S. by Ansi.

GSPC: Graphics Standards Planning Committee. A committee that operated under ACM Siggraph from the early '70s to 1979, when it published the second and final version of the Core report.

Iges: Initial Graphics Exchange Standard. Now an Ansi standard,

this is a standard for a file for transporting CAD/CAM design data between different vendors' design systems.

NAPLPS: North American Presentation Level Protocol Syntax. This is a joint Canadian-U.S. standard for videotex that includes some computer graphics capabilities.

Phigs: Programmer's Hierarchical Interface to Graphics. A proposal by the Ansi X3H31 technical committee for a software standard to address very dynamic systems.

Siggraph: Special Interest Group in Computer Graphics. A special interest group within ACM.

VDI: Virtual Device Interface. A proposal for a standard interface for computer graphics devices.

VDM: Virtual Device Metafile. A proposal for a standard computer graphics "picture file" that would allow archiving and transporting of computer graphics-generated pictures.

Videotex: Origin: Video + Text. Generically, a method of connecting televisions or television-like devices to telephone or telephone-like systems to provide consumers and businesses with a way of accessing textual (and later pictorial) information.

X3: A technical committee operating under Ansi rules, responsible for computer-related standards in the U.S.

X3H3: The technical committee under X3 responsible for computer graphics standards.



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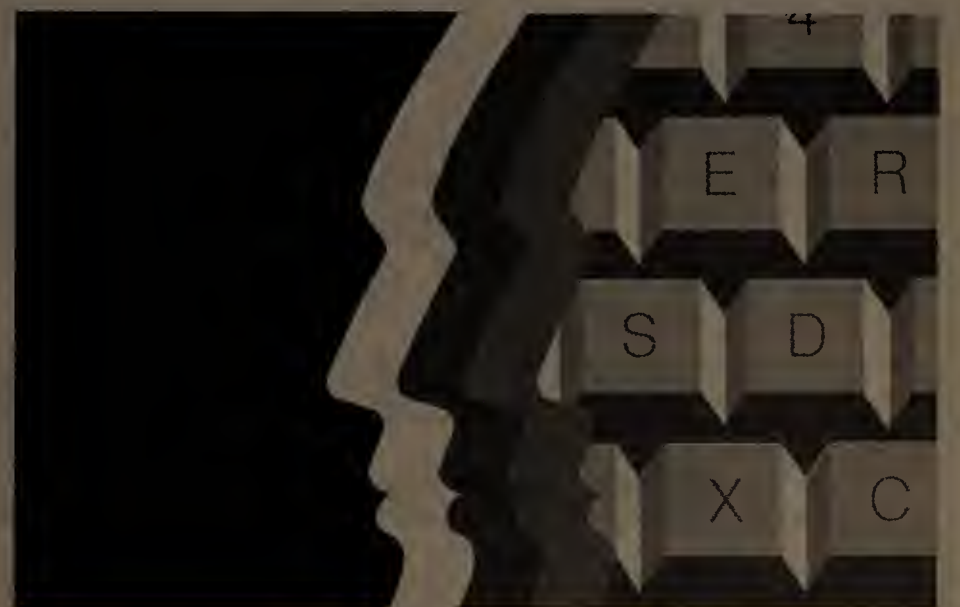
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Calendar

Week of Oct. 2

Oct. 6-7, New York — **The Fourth Annual Computer Law Institute.** Contact: Julia Kelly, Law and Business, Inc., 757 Third Ave., New York, N.Y. 10017.

Oct. 6-7, Washington, D.C. — **IMS/VS Data Communication Programming.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

Oct. 6-7, Bass River, Mass. — **The 1983 NCR New England Computer Users' Group.** Contact: Thomas Lovett, NCR New England Computer Users' Group, Bass River, Mass. 02664.

Oct. 6-7, Los Angeles — **IMS/VS Dump Reading.** Contact: Data Base Management, Inc., 1075 Tolland

Tnpk., Manchester, Conn. 06040.

Oct. 6-7, Dallas — **Data Administration: Successful Techniques.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 6-7, San Francisco — **Data Administration: Development and Practice.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Oct. 6-7, Washington, D.C. — **Supercomputers.** Contact: Education Foundation of the Data Processing Management Association Conferences (Supercomputers), P.O. Box 368, 3420 Kashiwa St., Torrance, Calif. 90501.

Oct. 6-7, Cary, N.C. — **SAS Color Graphics Course.** Contact: SAS Insti-

tute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Oct. 6-8, San Jose, Calif. — **Network '83: The Missing Link.** Contact: MS.BS., Inc., Suite 9, 1610 Blossom Hill, San Jose, Calif. 95124.

Oct. 7-9, Orlando, Fla. — **Great Southern Computer and Electronics Show '83.** Contact: Great Southern Computer and Electronics Shows, P.O. Box 655, Jacksonville, Fla. 32201.

Oct. 8-10, Boston — **PC '83.** Contact: Northeast Expositions, 822 Boylston St., Chestnut Hill, Mass. 02167.

Week of Oct. 9

Oct. 9-12, Chicago — **The National Retail Merchants' Association (NRMA) Systems, Technology and Communications Conference.** Con-

tact: Information Systems Division, NRMA, 100 W. 31st St., New York, N.Y. 10001.

Oct. 10, Atlanta — **Meeting Japan's Strategic Challenge to the Information Systems Industries Marketplace.** Contact: Joan Merrick, The Datamation Institute, Suite 415, 850 Boylston St., Chestnut Hill, Mass. 02167.

Oct. 10-11, New York — **Introduction to Unix.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Oct. 10-12, Atlanta — **Introduction to Computer Concepts.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 10-12, Chicago — **Evaluating, Selecting and Using Computer Software Packages.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 10-12, St. Paul, Mo. — **The Society for Computer Applications in Engineering, Planning and Architecture (Cepa) 1983 Fall Conference.** Contact: Patricia Johnson, Cepa, Inc., 358 Hungerford Drive, Rockville, Md. 20850.

Oct. 10-13, Dallas — **DL/1 Application Programming.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

Oct. 10-13, New York — **CICS/VS Testing and Debugging.** Contact: Kaaren Perez, Comped, 10 E. 21st St., New York, N.Y. 10010.

Oct. 10-13, New York — **Info '83: Tying the Information System to the Business Plan.** Contact: Marketing Manager, Info '83, 708 Third Ave., New York, N.Y. 10017.

Oct. 10-14, Houston — **Contemporary Computer Auditing: Integrity Controls.** Contact: Marge Umlor, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

Oct. 10-14, Washington, D.C. — **Defense Computers — Graphics '83.** Contact: Defense Computers — Graphics '83, Suite 333, 2033 M St. N.W., Washington, D.C. 20036.

Oct. 10-14, New York — **Hands-On Unix Systems.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Oct. 10-14, Dallas — **MVS/SP (XA) Internals.** Contact: Linda Barcikowski, Computer Systems Research, Inc., 40 Darling Drive, Avon, Conn. 06001.

Oct. 10-14, Birmingham, Ala. — **Auditing in the Contemporary Computer Environment.** Contact: Marge Umlor, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

Oct. 10-14, Orlando, Fla. — **IDMS-DC Programming.** Contact: Harris Education Center, 1025 W. Nasa Blvd., Melbourne, Fla. 32919.

Oct. 10-14, Washington, D.C. — **Computer-Aided Design and Manufacturing in Electronics.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Oct. 10-14, N. Attleboro, Mass. — **System/38 Applications Seminar.** Contact: Rick Sweeney, RTC Systems, Inc., 49 Plain St., Box 767, N. Attleboro, Mass. 02760.

Oct. 11, Seattle — **How to Write Better Software Users' Manuals** (Continued on Page 86)

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PHILADELPHIA, PA OCT 20 AM

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Calendar

(Continued from Page 84)

Faster. Contact: Promptdoc, 833 W. Colorado Ave., Colorado Springs, Colo. 80905.

Oct. 11, Charlotte, N.C. — **Personal Computers in the Business Environment.** Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Oct. 12 in Atlanta; Oct. 13 in Birmingham, Ala.; Oct. 14 in Memphis, Tenn.; and Oct. 24 in Boston.

Oct. 11-12, New York — **Guidelines for Successful Selection, Acquisition and Operation of Microcomputer and Minicomputer Systems.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Oct. 11-12, Boston — **Computer-Aided Design Conference (Cadcon)** 83. Contact: Cadcon East 83 Coordinator, Morgan-Grampian Expositions Group, Two Park Ave., New York, N.Y. 10016.

Oct. 11-13, Topeka, Kan. — **Feedback '83: DSSD Users' Conference.** Contact: Georganna Carson, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

Oct. 11, Washington, D.C. — **Introduction to Micros.** Contact: Microcomputers in Government, Department KL, 1805 Power Mill Road, Silver Spring, Md. 20903.

Oct. 11-14, Hartford, Conn. — **Focus Query Language for DP Personnel.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

Oct. 11-14, White Plains, N.Y. — **Structured Design and Programming.** Contact: Ruth Dordick, Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405. Also being held Oct. 18-21 in Anaheim, Calif.

Oct. 12-13, San Francisco — **The Changing Role of the PBX.** Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

Oct. 12-13, Dallas — **The Fourth-Generation Data Management Software Show.** Contact: Software Institute of America, 339 Salem St., Wakefield, Mass. 01880.

Oct. 12-14, Denver — **Data Base Management Systems: A Comparative Analysis of General-Purpose Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 12-14, Baltimore — **Data Communications Systems.** Contact: Center for Advanced Professional Education (Cape), Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Oct. 12-14, Houston — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Oct. 12-14, Philadelphia — **Introduction to Office Automation: Concepts, Technology and Application.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 12-14, Cary, N.C. — **Macro Language Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Oct. 12-14, Atlanta — **Microcomputers: A Guide to Selection and Applications.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 12-14, New York — **VSE Internals, Debugging and Problem Determination.** Contact: Tom LaSalle, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

Oct. 12-14, Orlando, Fla. — **Software Verification and Validation.** Contact: Education Foundation of the Data Processing Management Association, Department SVV, P.O. Box 368, 3420 Kashiwa St., P.O. Box 3608, Torrance, Calif. 90510.

Oct. 12-14, Los Angeles — **Network Communications Protocols.** Contact: Center for Advanced Professional Education (Cape), Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Oct. 12-14, New York — **Distributed Systems Design: Micros to**

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Truly Interactive Processing

MAPS/GL was designed for today's powerful, interactive minicomputers — not adapted from an out-of-date mainframe-oriented batch system. Inquiry, updating and reporting functions can be performed online, right now. So your accounting staff becomes more productive. And your information much more accessible to management.

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MAPS/GL was developed by Price Waterhouse under the name "FM80" and adapted for the VAX by Ross Systems, Inc. Our license includes the support necessary to keep MAPS/GL current with new FM80 releases. Price Waterhouse markets and supports FM80 on computers other than VAX.

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Calendar

Mainframes. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 12-14, Denver — **The Beginning of the New Telecommunications Era.** Contact: Marilyn Moore, COM, Inc., Consulting Service, 432 S. Broadway, Denver, Colo. 80209.

Oct. 12-14, Hasbrouck Heights, N.J. — **Unix.** Contact: Center for Advanced Professional Education (Cape), Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Oct. 12-14, New York — **Automated Application Design: Products, Concepts and Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 12-14, Tampa, Fla. — **Personal Computers and Networking.** Contact: Center for Advanced Professional Education (Cape), Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Oct. 12-14 in Anchorage, Alaska.

Oct. 13-14, New York — **Strategic Planning for Information Systems.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Oct. 13-14, New York — **Artificial Intelligence: Expert Systems.** Contact: The Technology Transfer Society, Department EXS, P.O. Box 368, 3420 Kashiwa St., Torrance, Calif. 90510. Also being held Oct. 17-18 in Washington, D.C. and Oct. 20-21 in Boston.

Oct. 13-14, New York — **Integrated Data, Voice, Facsimile and Video Communications.** Contact: Data Communications, McGraw-Hill Publications Co., Special Projects Conference Management Center, c/o Information Breakthroughs, Inc., 445 W. Main St., Wyckoff, N.J. 07481.

Oct. 13-14, New York — **Shell Programming on the Unix.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Oct. 13-14, Atlanta — **Developing Business DP Systems.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 13-14, San Francisco — **Rational Data Base: Fact or Fancy?** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 13-14, Boston — **Managing Computer Projects.** Contact: Battelle Memorial Institute, 4000 N.E. 41st St., P.O. Box C-5395, Seattle, Wash. 98105.

Oct. 13-14, Sunnyvale, Calif. — **Security Management Forum.** Contact: The Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Oct. 13-14, San Francisco — **Performance Management Seminars: MVS, IMS and CICS.** Contact: Candle Corp., Suite 2404, 10880 Wilshire Blvd., Los Angeles, Calif. 90024. Also being held Oct. 17-18 and again Oct. 20-21 in New York.

Oct. 13-14, Washington, D.C. — **The Next Five Years and Beyond.** Contact: The Technical Marketing Society of America (TMSA), N5Y Conference, P.O. Box 368, 3420 Kashiwa St., Torrance, Calif. 90510.

Oct. 14-15, Dallas — **IMS/VS Data Communications Programming.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

Oct. 14-16, Philadelphia — **The Third Annual Symposium on Small Computers in the Arts.** Contact: The Institute of Electrical and Electronics Engineers, Inc. (IEEE), Philadelphia Section, Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, Pa. 19174.

Week of Oct. 16

Oct. 16-18, Austin, Texas — **The Texas Association for Educational Data Systems (TAEDS) 1983 Convention.** Contact: Tom Hopper, Northside ISD, 5900 Evers Road, San Antonio, Texas 78238.

Oct. 17, Houston — **IMS Concepts and Facilities.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-18, Chicago — **Systematic Software Testing.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-18, New York — **Focus for the End User: Basic Report Preparation.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 17-18, Atlanta — **Component 3: Managing the Human Aspects of Technological Change.** Contact: O.D. Resources, Inc., Building 16, 2900 Chamblle-Tucker Road, Atlanta, Ga. 30341.

Oct. 17-18, Washington, D.C. — **An Applications-Oriented Approach to Artificial Intelligence.** Contact: Continuing Engineering Education, George Washington Uni-

versity, Washington, D.C. 20052.

Oct. 17-18, Sunnyvale, Calif. — **Management Implications of Structured Techniques for Microprocessors.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-18, Dallas — **Local-Area Networks: Selection Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 17-19, Minneapolis — **DL/1 Applications Programming.** Contact: Karen Perez, Comped, 10 E. 21st St., New York, N.Y. 10010.

Oct. 17-19, San Francisco — **Information Center Concepts: Organization and Implementation.** Contact: (Continued on Page 88)

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Calendar

(Continued from Page 87)

Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 17-19, Washington, D.C. — **IMS/VS Message Format Services.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

Oct. 17-19, Dallas — **Data Processing for the Nondata Processing Executive.** Contact: The American Management Associations, 135 W. 50th St., New York, N.Y. 10020. Also being held Oct. 24-26 in Boston.

Oct. 17-19, Boston — **Developing Automated Human Resource Management Systems.** Contact: The American Management Associations, 135 W. 50 St., New York, N.Y. 10020.

Oct. 17-19, New York — **Data Base Management Systems: Concepts and Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 17-19, White Plains, N.Y. — **Hands-On Pascal Workshop.** Contact: Ruth Dordick, Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405. Also being held Oct. 31-Nov. 2 in Boston.

Oct. 17-19, New York — **Computer Operations: Effective Production Scheduling and Control.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 17-19, Saddlebrook, N.J. — **Personal Computers and Networking.** Contact: Center for Advanced Professional Education (Cape), Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Oct. 17-19, San Francisco — **Internal Controls and Data Security Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-19, Dallas — **Personal Computers: Strategies for Managing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 17-19, San Diego — **The Seventh Annual Data Entry Management Association (Dema) Conference: The Commitment to Quality.** Contact: Dema, P.O. Box 3231, Stamford, Conn. 06905.

Oct. 17-19, New York — **DOS/VSE Job Control Language.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-19, Houston — **Computer Performance Measurement and Capacity Planning: Tools and Techniques.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 17-19, Chicago — **Data Communications Concepts and Facilities.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-19, Orlando, Fla. — **IDMS-DC Transaction Design.** Contact: Harris Education Center, 1025 W. Nasa Blvd., Melbourne, Fla. 32919.

Oct. 17-19, Jacksonville, Fla. — **Project Leadership Laboratory.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-19, Los Angeles — **Data Communications for Microcomputers: Acquisition, Applications and Implementation.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 17-19, Los Angeles — **VM/SP**

Structure, Flow and Tuning. Contact: Ken Carozza, Regional Marketing Coordinator, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

Oct. 17-19, New York — **Improving Office Productivity: Principles and Practices.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 17-20, Washington, D.C. — **Software Quality Assurance: A Management Systems Approach.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Oct. 17-20, Cary, N.C. — **Introduction to Data Processing Using SAS (CMS) Course.** Contact: SAS Institute, Inc. P.O. Box 8000, Cary, N.C.

27511.

Oct. 17-20, Anaheim, Calif. — **CICS On-Line Application Design.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-20, Milwaukee — **Project Management.** Contact: Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814. Also being held Oct. 17-20 in Toronto.

Oct. 17-21, New York — **Advanced Structured Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-21, Munich — **Systems '83.** Contact: Kallman Associates, 5 Maple Court, Ridgewood, N.J. 07450.

Oct. 17-21, Denver — **Structured Analysis and Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of



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Calendar

the Americas, New York, N.Y. 10036. Also being held Oct. 17-21 in New Orleans and Oct. 17-21 in Puerto Rico.

Oct. 17-21, New York — **IDMS Application Programming**. Contact: Kaaren Perez, Comped, 10 E. 21st St., New York, N.Y. 10017.

Oct. 17-21, Seattle — **Structured Analysis and System Specification Workshop**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-21, Englewood Cliffs, N.J. — **Financial Analysis for Capacity Management**. Contact: The Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Oct. 17-21, Minneapolis — **Struc-**

tured Systems Development. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-21, Orlando, Fla. — **CICS Programming**. Contact: Harris Education Center, 1025 W. Nasa Blvd., Melbourne, Fla. 32919.

Oct. 17-21, Atlanta — **Structured Design Workshop**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-21, Chicago — **Structured Analysis Workshop**. Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011. Also being held Oct. 24-28 in Boston.

Oct. 17-21, New York — **Structured Design and Programming Workshop**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New

York, N.Y. 10036.

Oct. 17-21, Washington, D.C. — **Microprocessors and Microcomputers: Theories and Applications**. Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Oct. 17-21, Boston and New York — **Structured Analysis and Design Workshop**. Contact: Kaaren Perez, Comped, 10 E. 21st St., New York, N.Y. 10010.

Oct. 17-21, Long Beach, Calif. — **Structured Analysis for Real-Time Systems**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-21, San Francisco — **Structured Analysis/Design**. Contact: Structured Methods, Inc., 7 W. 18th

St., New York, N.Y. 10011.

Oct. 17-21, New York — **Data Base Administrators' Workshop**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-21, Springfield, Mass. — **Systems Analysis Workshop**. Contact: Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

Oct. 17-21, New York — **Software Maintenance Workshop**. Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Oct. 17-21, San Diego — **The 24th National Computer Security Seminar and Workshop**. Contact: Education Department, Data Processing Security, Inc., 200 E. Loop 820, Fort Worth, Texas 76112.

Oct. 17-21, Chicago — **Project Planning and Control Workshop**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 17-21, New York — **Structured Data Base Design Workshop for 1983**. Contact: Learmonth and Burchett Management Systems, Inc., Suite 320, Dresser Tower, 601 Jefferson, Houston, Texas 77002.

Oct. 17-21, San Francisco — **CICS/VS Command Level Coding**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 18, Boston — **Artificial Intelligence**. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Oct. 19-21 in Boston.

Meet to Cover Computer Music

ROCHESTER, N.Y. — The 1983 International Computer Music Conference will be held here Oct. 7-10 at the University of Rochester's Eastman School of Music.

The conference will include four concerts, informal sessions, tutorial sessions, paper presentations, demonstrations and panel discussions. Between 400 and 500 participants from around the world are expected to attend.

James Moorer of the Lucasfilm Audio Studio will keynote the event. Moorer will speak on the new sounds that machines enable composers to make and the problems associated with documenting these new forms of music.

Conference registration is \$50. Further details on the International Computer Music Conference can be obtained from Robert Kraus at the Eastman School of Music, 26 Gibbs St., Rochester, N.Y. 14604.



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EDITORIAL

Silent Watchers

For several years, government agencies have been matching various computer files to identify persons improperly receiving government benefits. Although the practice probably violates the 1974 Privacy Act, it has continued with little public notice, partly because the targets have been low-income citizens, such as welfare recipients, whose rights are of little concern to most Americans. Now the matching is moving to the big time: The Internal Revenue Service will be testing a match program that checks up on every U.S. citizen and zeros in on affluent ones in particular [CW, Sept. 5].

The IRS, hungry for increased revenues, said it plans to test the feasibility of matching its files against commercial lists of U.S. residents, ordered by address and income. If the IRS master file does not contain the name and address of someone judged to have a high income, the agency will assume that person has failed to file a tax return and begin an investigation.

Put another way, while you sleep, the IRS will be surveilling your life-style. Do you own an expensive car? Do you live in an neighborhood of above-average wage earners? Based on this and other data, the IRS will be using a statistical profile to gauge your income and make enforcement decisions from the profiles. Some third-party list broker will make a subjective, unsubstantiated decision about your income, and the IRS will launch an investigation against you if its records do not correspond to that data.

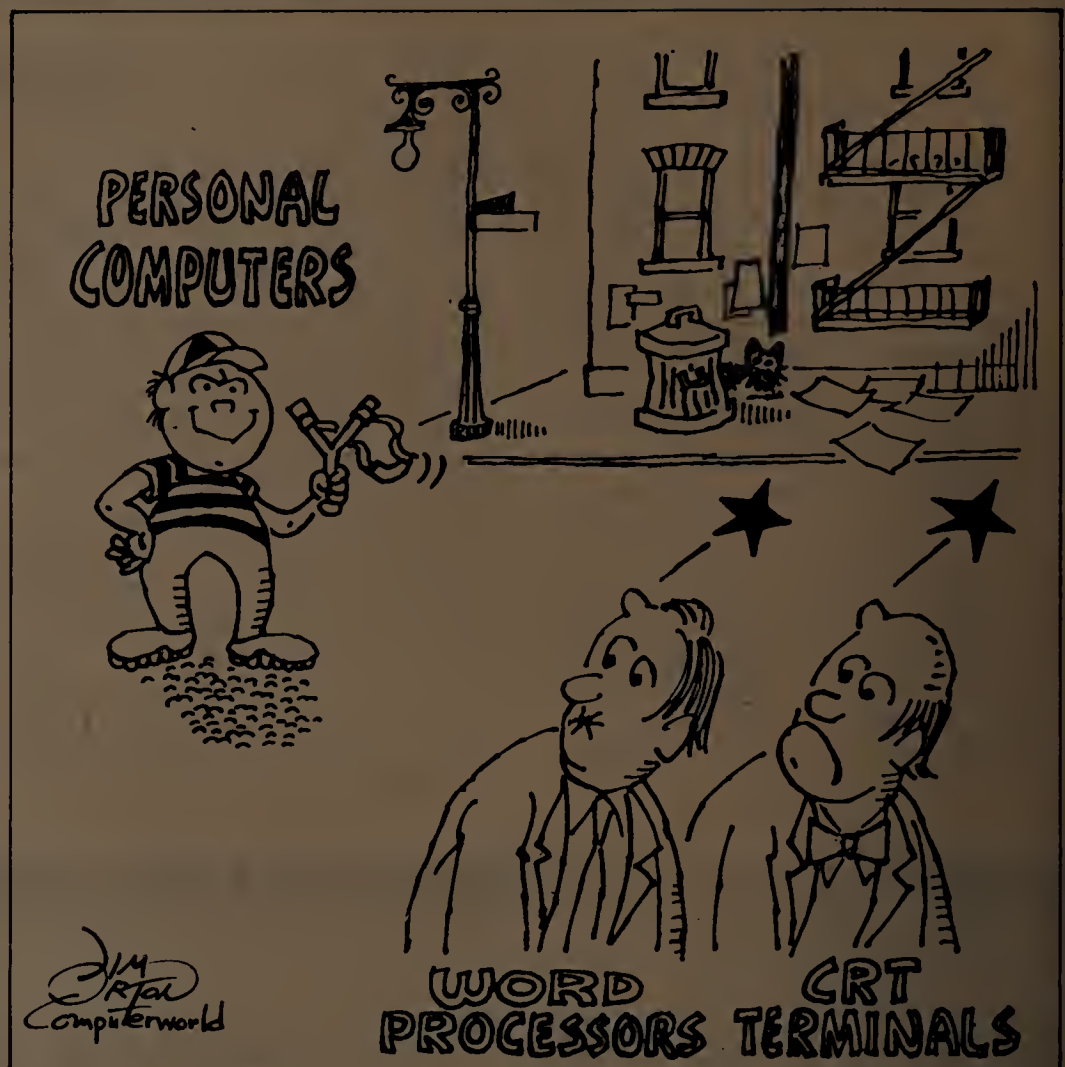
Of course you will be given a chance to defend yourself, and that's just what it will be — a defense against charges brought by nameless third parties whom you have never seen or to whom you have never talked. You will be considered guilty until you prove yourself innocent, and the evidence against you will possibly be self-incriminating information you supplied to various agencies with no idea it would be used against you.

It is bad enough when buying a car, paying local property taxes and answering U.S. Department of the Census questionnaires lead to an avalanche of junk mail targeted your way by commercial mailing address brokers who collect data from such sources. But when that same action can lead to possible IRS investigation, something is seriously out of whack.

The IRS argues it is only using publicly available data. That may be true, but the availability of the data has no bearing on whether it is reasonable or legal to use it for criminal investigations. This is nothing more than high-tech rumor mongering. And the rumors have nothing to do with whether you have paid your taxes. No, the rumors have to do with the way you live.

In an age of surveillance, it is dangerous to stand out, even if it is just for having an expensive automobile. We can only hope the IRS plan is not a sign of things to come, of a time when conformity is the only safety from the silent watchers in government agencies.

Based on recent congressional actions to limit the surveillance and computer capabilities of the IRS, we can only assume this plan would not be approved if the IRS had to ask for the money to develop its own profile information and had to get access to Census and local and state tax records on its own rather than purchasing this information cheaply from commercial sources. We hope Congress will look carefully at this program to see whether it violates the privacy directives now governing IRS operations.



New Kid on the Block

LETTERS

IBM Micros in France

The article in "International Report" on sales of the IBM Personal Computer in France [CW, July 18] is inaccurate.

While actual sales figures are proprietary, the number of Personal Computers sold in France is considerably higher than was reported, and sales are accelerating.

As regards price, we believe that the IBM Personal Computer is competitively priced in the French marketplace.

Allegations that French vendors' peripheral devices cannot be attached to the Personal Computer and that support for the French keyboard requires a large amount of system memory are incorrect.

Documentation exists to enable users to attach French vendors' peripherals to their systems. Support for the French keyboard routine re-

quires only 1.8K bytes of memory.

M. Aguerreberry
General Director
IBM France Diffusion

IBM
Paris, France

Associated Costs

I wish to share my reaction to Charles P. Lecht's "For Whom the Bell Tolls . . . For Free" [CW, Aug. 8]. Sending a message such as the type he describes would not be free.

Lecht ignores the cost of the computers and associated equipment at each end of the line and the rental cost of the monopolized phone terminations, not to mention the inevitable eventual increase in long-distance phone rates and even a possible "call attempted" charge if his practice became widespread.

William H. Boyd Jr.
Diamond Bar, Calif.

DATA PAST

Five Years Ago Sept. 18, 1978

TEHRAN, Iran — IBM stopped leasing and selling computer equipment here in a dispute with the government over a \$20 million tax bill. Irani government officials estimated that a large part of the tax bill would be settled in favor of the U.S. corporation.

Ten Years Ago Sept. 19, 1973

STOCKHOLM, Sweden — What was called the world's first national law covering the operation of data banks containing personal information went into effect here with the appointment of Claes-Goran Kallner as the first chairman and director-general of the Swedish Data Inspection Board.

ATLANTA — Cobol and a software support feature that reportedly boosted the System/34's distributed processing capabilities and allowed Systems Network Architecture communications highlighted a list of seven IBM enhancements unveiled.

FORT WAYNE, Ind. — Cynthia Crooks, 19, was found guilty of violating Indiana's trade-secret law with the attempted sale of a service bureau's programs to a client of the service bureau.

HUMAN CONNECTION / Jack Stone†

Shabby Sales Tactics Threaten DP Credibility

No wonder some well-known manufacturers in the low-cost computer industry are sinking rapidly and others have not much more than a nose above water. If the reasons are not completely obvious to the vendors, they certainly are to the consumers — a classic case of product overstatement and underperformance.

In my view, merchandising tactics have taken on all the character of New York marketing expertise — not the power brokers of Madison Avenue, but the hawkers and discounters and pirate videotapers of 42nd Street. The result? A terrific drop-off in sales for those who so richly deserve it. And why? Because the consumers have wised up to the circus sideshow salesmanship, and most of them are going to sit on their hands until they find a production computer that truly does what the sales literature implies and at the right price.

In case you don't track the small-machine business, I'll tell you what they're waiting for in this generation's ultimate consumer machine: a complete system, including a decent,

but slow, printer and generalized software for spreadsheet, word processing and file management, plus a little Basic for a comfortable target price of about \$600.

Some Examples

Here are some of the marketing beauties to which I am referring:

● **The "It's Coming Soon So Defend Your Decision" Gambit.** A major manufacturer announced a few months ago a perfect fit with the ultimate consumer machine specs with immediate availability. The manufacturer even took to TV to promote it. The status? What with all the glowing publicity, I really thought the machines would be saturating the retail shelves, but they never showed up.

I cannot help pondering along with the other 10,000 industry watchers and market analysts if the announcement was not just a sales thrust to get everybody all excited, cause them to delay a competitive purchase and then make them positively livid for lack of delivery follow-through. There's no better way to set revenues back a generation or

two than by making outlandish claims and then not shipping the first product on time.

● **The "Grand Opening Special" Strategy.** A seeming joy for all is the "sale" that goes along with an opening of a new store in the retail chain. One vendor just loves to take out full-page ads with such announcements, replete with come-ons based on discounts of out-of-production equipment.

● **The "Lookie Here at All This Free Software" Riposte.** Sometimes the selling tactic can backfire. Take the ad by NEC Information Systems, Inc. dealers in *The Washington Post*, Aug. 22: "Get NEC's Advanced Personal Computer Plus \$2,200 Worth of Business Software for Just \$2,748," with the subhead "Offer Ends Sept. 30."

Such massive unloading, by my calculations, can be explained in one of the following ways or any combination thereof: First, the retailers are in fire-sale mode, going broke fast, in which case consumers certainly don't want to deal with them.

Second, if the software is truly worth \$2,000, then the machine, a 16-

bit affair (no other specs stated) is valued at \$548, which makes it another formerly way-overpriced machine whose real value has been determined by market forces.

Third, maybe it's the other way around, namely, the software library — including seven items that seem to be mentioned in bundled giveaways from every retailer — is valued at \$548 and the machine at \$2,200, which makes the software another formerly way-overpriced library whose value has been determined by market forces.

Fourth, isn't it possible that the software and hardware are really only worth \$548 each, making the real value only \$1,096 total? On this basis, the newly advertised discount price of \$2,748 is nearly 300% of its real value.

I don't plan to look at the product until it proves to be a genuine bargain — more like \$548 for the whole kit and kaboodle. And I daresay that many potential consumers felt about the same way when they saw the ad.

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

READER COMMENTARY/Douglas Bybee†

Some Tips for Negotiating DP Contracts

My first boss once told me that negotiating a DP contract is like negotiating a divorce — one has a legal obligation and a moral obligation. Make sure your legal obligation is as little as possible and do what you want with your conscience, he went on to say. Unfortunately, most managers approach vendors/consultants like guilt-ridden husbands.

I was recently hired as a mutually agreed upon arbitrator to preserve a troubled contract. In its broadest sense, the contract concerned automating the company's offices. Generic features of the system included electronic filing, electronic mail, word processing, local networking, remote data base access, query with graphics, independent workstation computing capability and vendor recommendations. I believe the deliveries appropriately covered almost every current industry cliché, though not community microcomputing.

Although the contract had a germane beginning — that is, applications and the number of workstations had been identified via site — it was laboring on its deathbed, suffering from the three major deliverables to payments and/or penalties.

After a concerted, but short-lived, effort it became quite evident that both contracting parties wanted out. We eventually blamed the contract's demise on some nefarious third states, state of the art (interface problems between system components and local nets, personal computers and existing CPUs) and state-of-the-art economy (cash-flow problems dictated it was best to wait).

All parties saved face. The consul-

tant maintained their integrity, the buyer gained a tangible, but expensive, benefit and we avoided litigation.

I finally suggested we renegotiate the contract at a later date and concentrate our efforts on resolving immediate deliverable/payment problems. The company's chief executive officer said "good idea," the consultant said "good idea" and I said "thank you." A few days later, we all went home. I learned two months later that the company's DP director went home for good.

I like DP managers — I was one for 15 years and escaped an ax or two myself by moving on — but it continues to amaze me that experienced, intelligent, dedicated managers cannot negotiate and monitor a contract.

The DP manager has four powerful weapons in his arsenal:

- The reputation of the vendor/consultant.
- Ownership of the finished project.
- Money.
- The want of his signature.

Here are some negotiating and monitoring rules; they are not textbook rules (get your legal staff involved) and they are not general rules (write everything down, read the fine print). They are business survival rules:

- Go to the dictionary and look up the definitions of "negotiating" and "monitoring."
- Of paramount importance is how and by whom a contract may be terminated. Make sure the termination options are in your favor. You terminate anytime with five days' notice; they terminate with 60 days

notice and only at certain points. They terminate with penalty; you do not.

● Pay as little as possible as late as possible. Money is not only the best performance sanction, its use is a valuable resource to your company.

● Get as much as you can as early as you can. In the same four-phased project, shove everything you can into the first phases; develop sub-phases for sign-offs.

● Own everything produced immediately. This includes every memo, every test file, every preliminary document and every rough draft. Try diligently not to have draft copies and testing materials ownership related to payments.

● Have the option of removing any of the consultant's personnel at any time during the contract. Fear is a poor motivator for your own employees, but it's fine for someone else's if necessary.

● Phase activities so that you have a quick tangible deliverable. Tangible does not mean a general design document. Depending on the magnitude of the project, tangible might mean a program written, documented and produced or a distributed test site installed and functioning (even if it's addressing a fabricated application). Involve as many parties as possible to the contract with this deliverable — user departments, equipment vendors, legal staff, executive staff, engineers, building maintenance, a broad spectrum of your staff and the consulting staff and yourself.

This test phase can run concurrently with the greater undertaking, and the objectives are evident. You

should have the ambiguities of every responsibility, every deliverable and every authority resolved before you proceed. To clarify the authority question, you might even force failure (make it a few days late). Be sure your executive managers appreciate what you are doing.

● Do not be afraid to wheel and deal, especially if the endeavor is relatively new to your industry. Think about it: What did you do when you made your vendor/consultant choice? You surveyed the market to see if an appropriate package could accommodate your needs, you surveyed your industry to see if you could piggyback someone else's experience and you weighed your selection to the vendor/consultant who had prior experience in a similar enterprise.

Successful experience with a marketable new system can be a consultant's most valuable asset.

● After you get a feel for the consultant's wants, have your legal department prepare a standard personal service contract presenting all generic activities (cancellation clauses, payment scheduling, personnel approvals and so on) to your advantage. Use the standard in your original conversations.

For some reason, DP managers generally feel that bargaining is distasteful, even unprofessional. Do it well, and I guarantee you will gain the respect of everyone, including the consultant/vendor.

● Remember that the ownership/marketing of the new system (in whole or in part) is a negotiable item.

Bybee is a managing partner for Downstate Media, Inc. in Springfield, Ill.

READER COMMENTARY

How to Apply Basic AI Techniques to Your

An increasing number of publications are signaling the entry of artificial intelligence (AI) as a source of applications with significant commercial value. Important advances have brought us closer to some practical voice and image recognition and synthesis, limited language understanding, robotics and electronic consultants. The latter — also known as expert systems — can already give sensible advice in different areas such as medicine, insurance, geology and investments.

What could this new technology mean to you or your company? The knowledge of an expert system is of

'If you are interested and have a personal computer, you may be closer than you think to learning, and perhaps even applying, some basic AI techniques in your line of work from which you can then extrapolate the possibility of future applications.'

human origin, but it is conveniently encapsulated in the form of "IF ... THEN ..." rules.

Dozens, hundreds and sometimes thousands of these plain-English rules constitute a valuable base of knowledge that can then be scanned by a generalized reasoning mecha-

nism — an inference engine.

The rules base can be scanned in either a forward mode, from facts to conclusions, or in a backward mode, where conclusions are treated as hypotheses that must be validated by confirmed rules. In contrast to traditional DP programs that are written

with a specific application in mind, an inference engine is generic; in other words, it is not locked into any specific decision path.

Expert systems can pick from alternative decision paths in the search of a conclusion. What personalizes an expert system is the domain of knowledge of the rules scanned by the inference engine. Certainly, unplugging a rules base on infectious diseases and plugging in a rules base on tax preparation will change the expertise of the system. Changing the content of just one rule might change the entire reasoning pattern of an expert system within a certain domain of knowledge.

All of this sounds exciting, and it is exciting. But what good is it to you or your company unless you own or have access to fairly expensive and sophisticated hardware and software?

Applying AI Techniques

If you are interested and have a personal computer, you may be closer than you think to learning, and perhaps even applying, some basic AI techniques in your line of work from which you can then extrapolate the possibility of future applications.

Since Lisp is considered to be the lingua franca of AI, it is a good idea to have a working knowledge of the language. Several Lisp interpreters are available for personal computers including:

- APP-L-ISP for Apple Computer, Inc.'s Apple II and Atari Corp.'s Atari from Datasoft, Inc. of Los Angeles.

- Cromenco-Lisp for the Zilog, Inc. Z80-based computer with Cromenco's Cdos/Cromix operating systems from Cromenco, Inc. of Mountain View, Calif.

- IQLisp for the IBM Personal Computer XT and other computers from Integral Quality of Seattle.

- Lisp for Osborne Computer Corp.'s Osborne-1 or any 8-in. Digital Research, Inc. CP/M system from Software Toolworks of Sherman Oaks, Calif.

- Lisp for CP/M and Radio Shack's TRS-80 cassette and diskette versions from Supersoft of Champaign, Ill.

- Lisp-88 for the IBM Personal Computer from Norell Data Systems of Los Angeles.

- Lisp may be available later this year for the 9836, a Motorola, Inc. 68000-based computer from Hewlett-Packard Co. of Palo Alto, Calif.

- Mulisp for the Intel Corp. 8080, 8085 or Z80-based computer under CP/M from Microsoft, Inc. of Bellevue, Wash.

- P-Lisp for the Apple II from Gnosis, Inc. of Philadelphia.

- Stiff Upper Lisp, for CP/M from Tennant & Tennant Computing of Garland, Texas.

- TLC-Lisp for the Z80-based computer under CP/M from Lisp Co. of Los Gatos, Calif.

As you can imagine, the prices of the Lisp interpreters vary from slightly less than \$100 dollars to several hundred, depending on what home or personal computer you have or plan to buy.

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Ray Weinstock†

Work When Using a Personal Computer

Most of the interpreters are working subsets of two main Lisp dialects used in large-scale projects: MacLisp and Interlisp. Although other languages could be used to implement AI applications, the important point is to get some exposure to Lisp. But the language by itself may be of little interest if you don't interact with some type of AI application. It is by the possibility of interacting with Lisp that you may discover its unique characteristics.

Understanding Basic Principles

If you have access to an Apple II or an IBM Personal Computer XT and decide to use APP-LISP or IQLisp, you can buy a scaled-down expert system package to help you understand basic principles. Xsys is a generalized expert system of interest to businessmen, teachers, students and those who wish to obtain or give a hands-on demo and educational experience.

Xsys includes a step-by-step tutorial on the basic components and interactions of an expert system and a 5¼-in. diskette, containing various standard inference engines in forward and backward reasoning modes. Examples are included, and the user may supply additional knowledge bases of "IF ... THEN ..." rules in other domains as well as modify and expand the inference engines.

Certainly, factors of conclusions can also be calculated by Xsys, and the criteria for calculation can be modified by the user. The rules base can be loaded initially or dynamically during the execution of Xsys as a succession of files to be scanned one by one. An experimental parser that allows the user to supply Xsys with initial facts in free-format language is also included in the package.

Process With Commands

The user can query Xsys both during and after the reasoning process with commands such as WHY a question is being asked; HOW a conclusion was reached; FACTS known so far; RULES USED successfully so far; RULE being tested presently; HYPOTHESIS being instantiated; ASKED NO, questions the user answered negatively; DEDUCED, for those facts inferred by the system; and many other commands. A program that automatically generates the hypotheses from a given knowledge base can also be activated. The IBM version can use the full 640K-bytes available in the Personal Com-

puter XT models.

In your playful moments, you can also interact with Eliza, which is available from Artificial Intelligence Research Group of Los Angeles for the Apple II, IBM Personal Computer and Osborne-1 computers. Eliza, first implemented at MIT in 1966, simulates a nondirective psychotherapist that analyzes each statement you type and responds with a coherent comment or question. This highlights pattern matching, another theme central to many AI applications. An offspring of Eliza, also known as Artificial Doctor, is appropriately called Artificial Neurotic. In

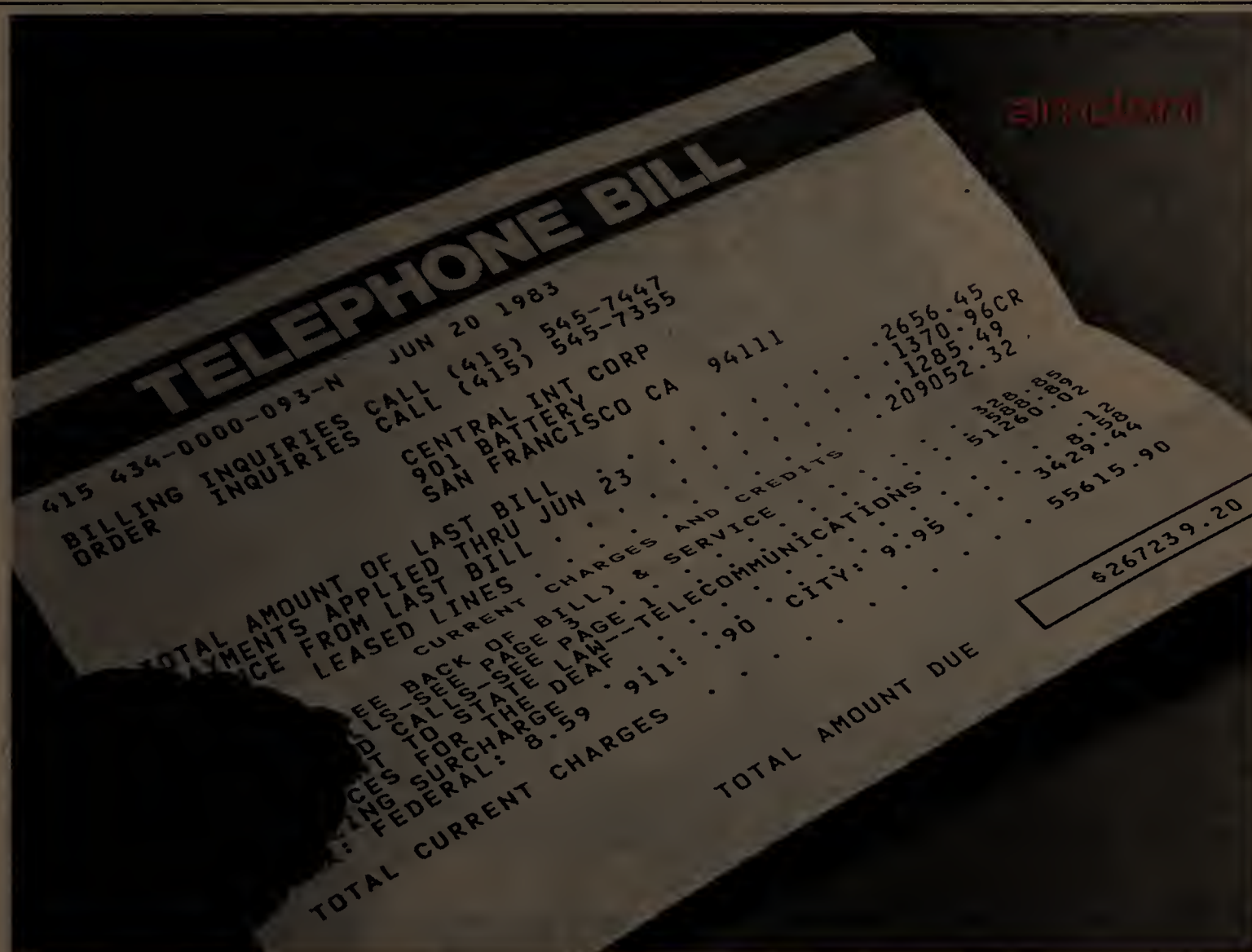
this program, you are the doctor and your computer is neurotic beyond hope.

There are many books on the subject, but not all of them are readily intelligible to a newcomer to the field of AI. Good starting points with which to improve AI literacy are *Artificial Intelligence and Lisp* by P.H. Winston (Addison-Wesley), *The Handbook of Artificial Intelligence* by A. Barr and E. Feigenbaum (William Kaufmann, Inc.) and *Principles of Artificial Intelligence* by Nils Nilsson (Tioga Publishers).

Once you begin experimenting you will find your own way. Remem-

ber to try simple things first. The objective is to build small-scale prototypes that work and that other people can understand. Later, larger systems can be built with the experience gained in this first phase. Getting hands-on experience with some of these techniques and systems is a must, as demonstrated by the increasing number of companies building small operational demos and prototype expert systems.

Weinstock is senior computer scientist in the Knowledge-Based Systems Group of the Advanced Computer Systems Department at SRI International of Menlo Park, Calif.



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GETTING AHEAD IN DP / Donald J. Berardo†

If You Want to Build Credibility, Don't Lie

Every time he told a lie, Pinocchio's nose grew. If you were Pinocchio, how long would your nose be?

Credibility is one of the most important qualities a manager can have. Without it, neither your employees nor your superiors will trust you, and that will hurt your career development; people don't like to work for managers they don't trust, and top brass is not likely to promote them.

There are a lot of ways to be dishonest — white lies, half-truths and, of course, bald-faced lies. As managerial techniques, none of these is advisable. If you are in the habit of us-

ing half-truths to motivate employees or soothe users, you are asking for trouble. There's an old saying that "a lie goes around the world before the truth even gets its britches on." The truth may travel slower than lies and rumors, but it always arrives and makes the liar look bad.

Dealing With Employees

How do you deal with your employees? Don't make the mistake of thinking that they won't notice half-truths.

Remember what Abraham Lincoln said about the chances of fooling all

of the people all of the time.

When you're reviewing an employee's performance, for instance, do you give him honest feedback, both positive and negative? Or do you gloss over weaknesses and give the false impression that everything's fine? Do you give full credit where it's due, or do you imply that his success is merely what's expected?

Do you have the courage and honesty to tell a technical whiz that he is less than politic when dealing with users and should take a course in interpersonal styles? If you don't tell your employees the truth and then

you deny them promotions or projects because of this fault, they'll blame you for not being honest with them — and they'll be right.

Common Situation

Consider another common situation, and ask yourself how you'd handle it. Upper management sends down a policy that adversely affects a few of your employees — no raises for the next six months. It's unfortunate, but you can understand the reasons. How do you present it to your employees? Do you tell them that the policy is horrible, that you think it's unfair and upsetting?

Or do you play it straight and say "I feel bad about this deferral, but upper management has decided it's necessary, and I agree. Here's why."

You must develop a reputation for trustworthiness if you expect loyalty and honesty from your employees. And your employees must also feel that you will stand up for them and protect their interests and reputations.

If you get attacked in a meeting, for instance, don't shove the blame off onto one of your employees. Word will get back to your area, and you will lose support, trust and, eventually, productivity.

General Rules

There are a number of general rules that will help you develop credibility. Be a good listener, and be compassionate. There's nothing easier to spot than a wandering mind and fake sympathy. Most of the guidelines, however, begin with "Don't":

- Don't lie.
- Don't support lies, rumors and half-truths by remaining silent.
- Don't panic; stand up for your beliefs and express them.
- Don't make political or economic gain your sole end; the means are equally important.

The fact is that, ultimately, telling the truth and being open takes less energy and causes less pain than the opposite. As Ben Franklin knew, it pays to be honest.

Berardo is a management counselor and career therapist. He is a vice-president with the Meld Group in West Hartford, Conn., publishers of a monthly newsletter on management development.

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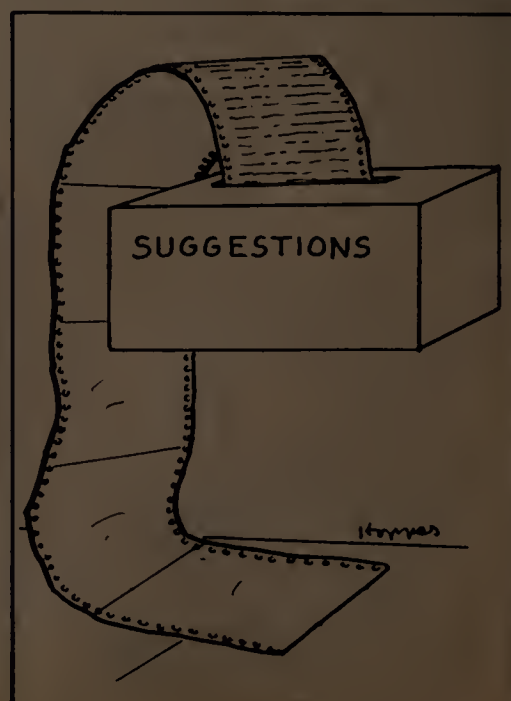
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READER COMMENTARY

Testing Systems for 'Dummy-Friendliness':

There probably isn't a company today that isn't experimenting with the equipment and systems that make up what's called "office automation." By any measure, this is a confusing arena; purchasers and vendors don't even agree on what the term means. This confusion, plus the array of products and services that are part of it, makes for some interesting management challenges.

Almost everyone agrees, though, that office automation involves people outside of the traditional data processing field. Whether it's a secretary with a word processing system or a vice-president with an executive workstation, this equipment is now, or soon will be, in the hands of computer novices.

Delivering the technology to the masses poses some interesting problems for the company that's evaluating various systems. The computer gurus cannot judge the equipment by their own standards anymore; all the bells and whistles that intrigue an expert often confuse or even frighten others.

This problem is a challenge for the data processing or management information systems manager. Many of these managers wisely choose to take potential (naïve) users of the systems with them on equipment shopping trips. The reason is simple: They want the ultimate user to be comfortable with the system. Of course, the more subtle reason for having the user tag along is that it buys insurance in case that wonderful user-friendly system turns user-hostile.

Corporate Dummy

If a little naivete helps, then a lot would be wonderful. Enter the new job titled "corporate dummy." At last, organizations will have a legitimate role for people who don't measure up. Their ignorance, lack of judgment and gross bumbling will become decided assets instead of liabilities. What better way to provide the ultimate test of a new computer than to show that it's not user-friendly but dummy-friendly.

All the executives who were in awe of the machine now will flock to it, assured that it's well within their capabilities. Of course, this might backfire if Groucho Marx's experience is any indication. In the film *Duck Soup*, Marx examines a report and says, "Why, a four-year-old child could understand this report. Run out and find me a four-year-old

child. I can't make heads or tails out of it." (Perhaps this is what some chief executive officers [CEO] have in mind when they talk about hiring special assistants to operate their executive workstations.)

Let's look more closely at the details of staffing the corporate dummy position. It

really isn't as simple as it seems; you can't just nominate the slow thinker in the other department for the job. Here are some points to remember:

- **Selection Criteria.** It's hard to say what kind of educational background would be best. You could argue that having (or not having) vari-

ous college degrees is excellent preparation. And even if you settled on the right degree and major, how could you equitably decide which university provided the best training?

No, it's better to look at required skills rather than education, for example, near-total oblivion to the world

around him (the person who lives not in a fog but in a cloud bank); demonstrated inability to use correctly even simple machinery (the kind of person that tries to force-feed a dollar bill upside down into a change machine); near-total disbelief in the possibilities of high technology (this person is still

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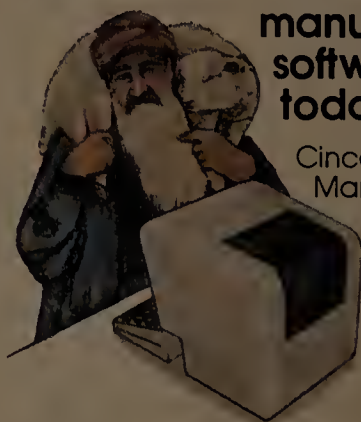
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Gil E. Gordon†

A Critical Procedure in the Office of the Future

troubled by the concept of an automatic ice cube maker); near-total distrust in high technology (this person feels compelled to refill an automatic ice cube maker with water); and keyboard phobia (this particular person is paralyzed when he has to choose the water temperature on a washing machine

control panel).

● *Sources of Candidates.* Employee referrals for this job should be encouraged with the catch that you cannot nominate someone more than two levels above you in your organization.

You can nominate co-workers, and bosses and subordinates may nominate

each other anonymously.

● *Initial Orientation and Training.* It's tough to structure the initial training for this job. In the case of ex-executives nominated for the slot, maybe it should start with some kind of deprogramming. This kind of cleansing ritual would clear the dummy's mind of all

remnants of prior rational skills and crisp managerial thinking. Some possible activities include a Three Stooges film festival; a six-hour, eight-stop commuter airline trip from New York to Buffalo, N.Y.; or a 24-hour marathon reading session of the last three months' worth of the major computer indus-

try journals.

● *Salary Administration.* It's hard to decide how much this person is worth. Most salary systems peg base pay to value of the position or relative value when compared with other jobs. Since this job could save the company untold thousands of dollars by avoiding poor purchases, maybe it should carry one of the top salaries in the company. In terms of relative value, you might look around your organization at jobs now held by people thought to be dummies and pay this position what they earn.

Pay increases and bonuses are another story. To begin with, how do you evaluate this person's performance? The usual performance appraisal categories go out the window.

Maybe the best way to pay for performance is on a piece rate basis. Pay the person a fee for each vendor demo he sits through, and make the fee directly proportionate to the market share of the vendor. Finally, be prepared to pay a 20% bonus if the corporate dummy successfully learns how to run a system made by a vendor of whose board of directors your CEO is a member.

The corporate dummy is a job whose time has come. Like the breakfast cereal ad in which the child gets his younger brother to try a cereal that's supposed to be good for him, office automation decision makers can now let someone else take that critical first plunge. And just think how much faster it would be to evaluate the various systems. All you'd have to do is let the corporate dummy loose on them and see how long it takes him to figure them out. Systems that promise a three-hour initial learning time wouldn't be considered further if the dummy mastered them in less than five minutes or more than one day, for example. After this first screening, you'd be left with only the legitimate candidates. Then it's time to consider the purely secondary criteria of cost, capacity and capabilities.

Leave it to the wonders of the office of the future to elevate to his rightful status someone who otherwise is looked down on and scorned. This new technology is definitely worth considering.

Gordon is founder and president of Gil Gordon Associates, a firm specializing in telecommuting and human resource management in Monmouth Junction, N.J.

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THE DATA CENTER /John P. Murray†

Why Do Some Information Centers Fail?

It is apparent to me that at least some of the root causes of information center failure can be traced to the same types of circumstances that bring about failure in the more traditional management information systems (MIS) projects. The information center failures of which I am aware have come about as a result of several particular causes.

However, there seems to be a common thread to information center failures:

- Lack of a comprehensive MIS information center plan.
- Failure to communicate effectively the goals of the information

'It can take considerable effort to gain acceptance from the organization's senior management to begin an information center project . . . If MIS has a poor track record and a lack of credibility within the organization, permission to install an information center will probably be given with little enthusiasm.'

center effort to the various client groups.

- Improper selection of early information center projects that are simply too grandiose.

The failure of an information cen-

ter effort can be more serious than may be apparent. The failure of the effort is of itself unfortunate; yet the poor impression that lingers as a result of such failure has more serious implications for the organization

and, of course, for MIS.

It can take considerable effort to gain acceptance from the organization's senior management to begin an information center project. It is often the case that the proposal is met with the usual degree of skepticism about any new process proposed by MIS. If MIS has a poor track record and a lack of credibility within the organization, permission to install an information center will probably be given with little enthusiasm.

To begin the information center effort under such circumstances and then to fail to deliver that which has been promised will only increase the skepticism about the overall capability of MIS within the organization. Because this is the case, the MIS department, if it attempts to reinstate the information center after a failure, faces a much more difficult task. The central issue with regard to the establishment of an effective information center must be to do it right the first time.

In addition, failure of the information center project tends to encourage the MIS clients to move ahead with the uncontrolled installation of microprocessors, which will allow them to obtain the results they need, results they probably were led to believe they would have obtained from the information center.

Expanded Use of Micros

Is the purchase and use of personal computers by these clients necessarily a bad thing? Of course not. However, it is unfortunate if the impetus to go that way is a consequence of the failure to plan and implement an effective information center properly. The introduction of an expanded use of personal computers should be based upon the merit of that use; it should not come about as a result of the failure of the information center.

Lack of appropriate planning for the introduction and use of the information center may not assure failure, but it will certainly make the effort much more difficult. MIS management must appreciate what can be accomplished with the information center and must then develop and implement a strong plan that will provide both adequate control and forward progress. The idea must be to make certain, as far as possible, that what is attempted can be accomplished.

There are two important criteria associated with the first information center projects, namely, they must be small and they must be successful.

Because the MIS department will have begun the movement to the information center environment, it is in a good position to assist in the selection of the first projects for implementation. If we fail to acknowledge the mistakes we have often made in the development of in-house MIS systems — that is, the tendency to attempt too much, to promise to deliver in too little time more than can be accomplished — we will assure the failure of the information center.

No matter how attractive or exciting
(Continued on Page 100)

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READER COMMENTARY/Jerry Sitner†

Defense's Implementation of Ada Evaluated

Why would the U.S. Department of Defense reject the findings of the committee that created Cobol approximately 24 years ago — especially considering that it was the sponsor of that committee's first meeting. With the tremendous advancement in terms of memory and CPU time, those findings are even more valid today.

The representatives from top government departments, industries' largest computer manufacturers and businesses recognized the importance of programming understandability over all other considerations. The No. 1 objective of that committee in designing the Cobol language was readability, not versatility or writability.

From the article "Military Computer Program Success," published in *The New York Times*, April 11, 1983, it is obvious that with Ada, the Department of Defense has decided to go counter to the Cobol committee's findings.

The basic reason given is standardization: one computer language to serve all. Quoting the article, "A single language would save the Pentagon billions in training and programming costs and is expected to make the military's computer system more effective by ending the electronic chaos that now prevails."

Repeating the article's quote of Dr. Robert F. Mathis, director of Ada Joint Program Office, Department of Defense, "Now the programmers who write radar systems for the Air Force and radar systems for the Navy can begin to talk to each other because they use the same language."

An important goal of standardization should always be greater understandability. To substitute standardized unproductive coding for noncommunicating languages is to trade electronic chaos for programming chaos. Standardizing what may or may not be a difficult language and not to have included the means to make it easily understandable is to commit an unforgivable sin. How is it beneficial to standardize unclear source coding?

As pointed out in the article, a serious problem for the Department of Defense is that many of the languages it is now using are computer-bound. Being hardware-bound denies those in the department the ability to communicate with each other. Ada will eliminate that problem, but so could many other single computer languages. In fact, we know that there are many different languages that can communicate with each other — it is just the hard-

'An important goal of standardization should always be greater understandability. To substitute standardized unproductive coding for noncommunicating languages is to trade electronic chaos for programming chaos. Standardizing what may or may not be a difficult language and not to have included the means to make it easily understandable is to commit an unforgivable sin. How is it beneficial to standardize unclear source coding?'

ware-bound ones that cannot — so Ada over others.
that is not a valid reason to select What then is there about Ada that

makes it more desirable than other computer languages? Surely it is not because there are more Ada programmers available in the marketplace. It would seem that the Department of Defense had decided on Ada because it felt it would be more powerful. Therein lies the quicksand.

Our Cobol forefathers warned us about placing a higher priority on language versatility than on understandability. The result of that mistaken priority will create as many problems as it will alleviate.

With Ada, the different areas of the Department of Defense will be
(Continued on Page 100)

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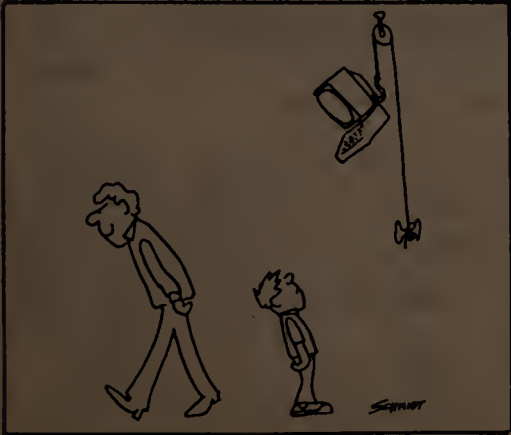
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Evaluating Defense's Implementation of Ada

(Continued from Page 99)

able to communicate. However, the communicating programs will be slow getting into production, and modifying them will become an insurmountable obstruction simply because no priority was given to understandability. Just as the many different languages the Department of Defense now has are unacceptable, so the Ada systems will soon become unacceptable.

'Professional Programmers'

In the article, Mathis said, "You must keep in mind our work is done by professional programmers." This was given in response to a statement as to how difficult a language Ada is.

I can only say to Mathis that we

have had professional programmers throughout data processing for many years and still there are productivity crises everywhere. To look to the professional programmer to make sense out of unclear program coding is a very serious mistake that can lead exactly to where the Department of Defense is heading. It is like bringing in the doctor after the patient has developed terminal cancer.

One does not have to be a psychic to predict that the Department of Defense will be no better off then it currently is after it implements the Ada system. The difference, of course, will be billions of taxpayers' dollars spent.

I would like to put forward two possible solutions.

If feasible, create a single computer language, call it Ada if you will, that can serve the Department of Defense's scientific and commercial needs, but insist it be designed to be easily understandable.

If this is not possible, then use two languages. One of those languages should definitely be Cobol because it has already been designed specifically to be understandable and has within it the means to be so. The fact that Cobol's understandability feature has never been used is not the fault of the language. All management need do is utilize it: Cobol would be its commercially oriented language.

Since I am not scientifically trained, I will not presume to select a

computer language for the Department of Defense's technical scientific needs. The judgment for that language should be based more on understandability than on technical versatility. If the language is not conducive to understandable coding, then discard it, no matter how powerful it is. For the Department of Defense to go in any other direction might very well weaken our country's defenses.

Sitner is president of Sitnerology Co. in New York.

Why Info Center Sometimes Fails

(Continued from Page 98)

ing it may appear, it is a mistake, as an initial effort, to attempt to help the organization's chief executive officer (CEO) develop some rather esoteric modeling project using the information center facility.

We should all know by now that nothing in MIS is as simple as it first appears. We need to understand what we can do and what we cannot do and then be able to accomplish that work with competence and dispatch before we attempt to tackle something much more difficult. The visibility of an information center failure at the CEO level is not desirable.

One starts with several small projects that not only will provide a reasonable payback, but more important, will demonstrate to MIS clients both the value and relative ease of the information center process.

If this approach is taken, and if some success is achieved, the opportunities to move to more challenging endeavors (perhaps even for the CEO) will soon come along. When these opportunities do come along, they can be handled successfully by the clients and then everyone, clients and MIS, will benefit.

The importance of the need for a strong, continuing communications effort between MIS and the client group must not be overlooked. The installation of an information center places the power of information processing systems directly into the hands of the MIS clients.

There is simply no reason for any information center to fail. If the correct approach is taken in the beginning, the effort will grow and expand at a rapid pace. All that is required is the application of reasonable management skills to the effort. Failure to apply those skills may be the cause of many of today's MIS difficulties.

Murray is director of MIS for Ray-O-Vac Corp., Madison, Wis. He is responsible for worldwide MIS activities. Murray has 21 years of DP experience, 10 of which have been devoted to the management of data centers.

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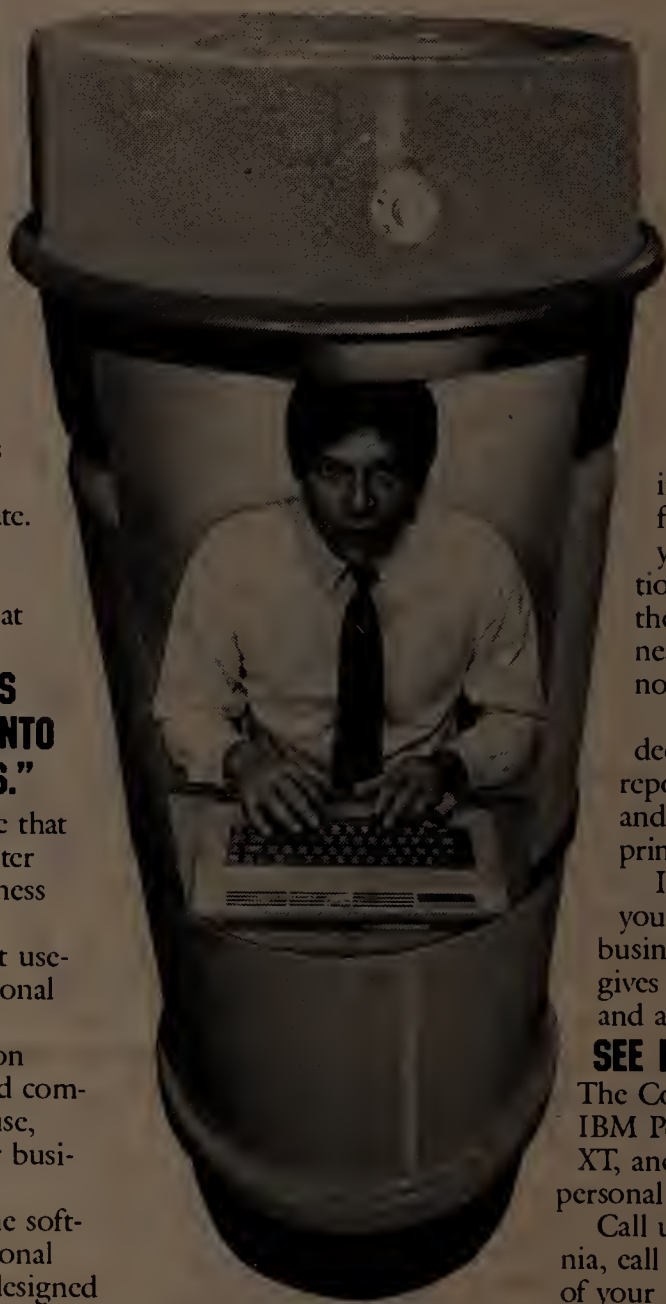
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San Francisco Oct. 13-14
New York City Oct. 17-18
New York City Oct. 20-21

Los Angeles Nov. 7-8
Chicago Nov. 14-15
Dallas Nov. 3-4

Day 1

8:30 - 9:00 A.M. Registration
 9:00 - 10:30 A.M.

G01: GENERAL SESSION

- Introduction to Performance Tuning Methodologies for MVS, IMS, and CICS Using Candle's Products
- Degradation Analysis
- Future Directions in Performance Analysis and Tuning

11:00 - 12:15 P.M.

G02: IBM's DIRECTIONS FOR THE LARGE SYSTEM ENVIRONMENT

- IBM's Directions and their impact on users
- The Evolution of MVS, VM, IMS, and CICS
- Effects on Performance Analysis and Tuning
- Extended Architecture and Beyond

MVS

1:30-4:45 P.M.

M01: SRM ANALYSIS AND TUNING

- SRM Functions
- Adjusting SRM Parameters
- Monitoring the SRM Using RMF, OMEGAMON, DEXAN,™ and EPILOG™
- MVS/XA Considerations

IMS

1:30-4:45 P.M.

I01: IMS COMMUNICATIONS

- General Communications Flow
- IMS Communications Pools
- Communications Queueing Considerations

CICS

1:30-4:45 P.M.

C01: CICS INTERNALS

- CICS Task Control Internals and Performance
- CICS Transaction Flow
- CICS Task Dispatcher Internals and Performance

Day 2

9:00-12:15 P.M.

M02: I/O CONFIGURATION ANALYSIS AND TUNING

- Detailed Analysis of How MVS Performs I/Os
- Optimizing I/O Configurations for Performance
- Shared DASD Considerations
- Differences in MVS/XA

9:00-12:15 P.M.

I02: IMS SCHEDULING

- General Scheduling Flow
- Scheduling Options
- Scheduling Pools

9:00-12:15 P.M.

C02: CICS PERFORMANCE TIPS AND HINTS

- Establishing Performance Objectives
- A Practical Approach to CICS Performance
- Performance Methodology and Detailed Solutions
- Operating Systems

1:30-4:45 P.M.

M03: PAGING/SWAPPING

- ASM Algorithms
- How to Configure the I/O Subsystem for Paging/ Swapping
- How to Measure the Impact of Paging/ Swapping
- MVS/XA Considerations

1:30-4:45 P.M.

I03: IMS APPLICATION EXECUTION

- Introduction to Execution Phases
- Application Phases
- Database I/O
- Data Communications Activity
- SYNC-POINT
- Database Pools Tuning
- Futures

1:30-4:45 P.M.

C03: CICS VSAM PERFORMANCE AND CICS STORAGE ANALYSIS

- File Control Functions
- VSAM Performance and its Effects on CICS
- CICS Storage Control

The cost for the two-day seminars, including all reference materials and lunches, is \$340 per person. Early registration is recommended

as attendance will be limited. For further details and registration, call Candle's Educational Services Department.

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An Interview

William C. Norris

Control Data's Maverick Chairman

Control Data Corp.'s William Norris is the architect of cooperation in an industry where competition is often cutthroat. He seeks profit by meeting social needs in areas where most other companies rarely venture — to the neglected inner cities and farms. He takes the long view of business profit and loss while the majority chase short-term gains.

CDC's 73-year-old founder and chairman continues to survive industry opinion which has labeled him at times "crazy," "foolish" and "crusty." Critics have said he should not have veered into manufacturing peripherals for the OEM market. How could he dare in 1968 take IBM to court for illegal selling techniques? How could he make money running a business with a social conscience — business should remain business and charity, charity. And what about Plato, that cash drain of more than \$900 million taking 20 years to develop — how could he expect teachers to accept computer-based education?

To these criticisms, Norris answers, "No, I don't recall any wrong decisions." The peripherals business blossomed into the company's greatest revenue source — 32% of last year's total. CDC came out of the IBM lawsuit with a \$101 million cash settlement and the opportunity to acquire IBM's data services subsidiary, the Service Bureau Company. The plants in disadvantaged areas are profitable business ventures, not charity, he insists. As for Plato, "It's going to be the largest segment of our business down the road," he says.

Norris grew up in Nebraska, a farm boy fascinated by electronics, particularly ham radios. At the University of Nebraska, he studied electrical engineering. In 1932, he graduated into the Great Depression; with jobs scarce, he headed home to run the family farm.

In World War II, Norris joined the U.S. Naval Reserve and was assigned to develop new intelligence gathering technologies. After the war, his team of researchers formed Engineering Research Associates. Five years later, ERA was acquired by Remington-Rand; in 1955, Remington-Rand and Sperry Corp. merged to form Sperry-Rand. "We sat there," Norris remembers those years, "with a tremendous technological and sales lead and watched IBM pass us as if we were standing still."

Having had "a bellyful of large companies" by

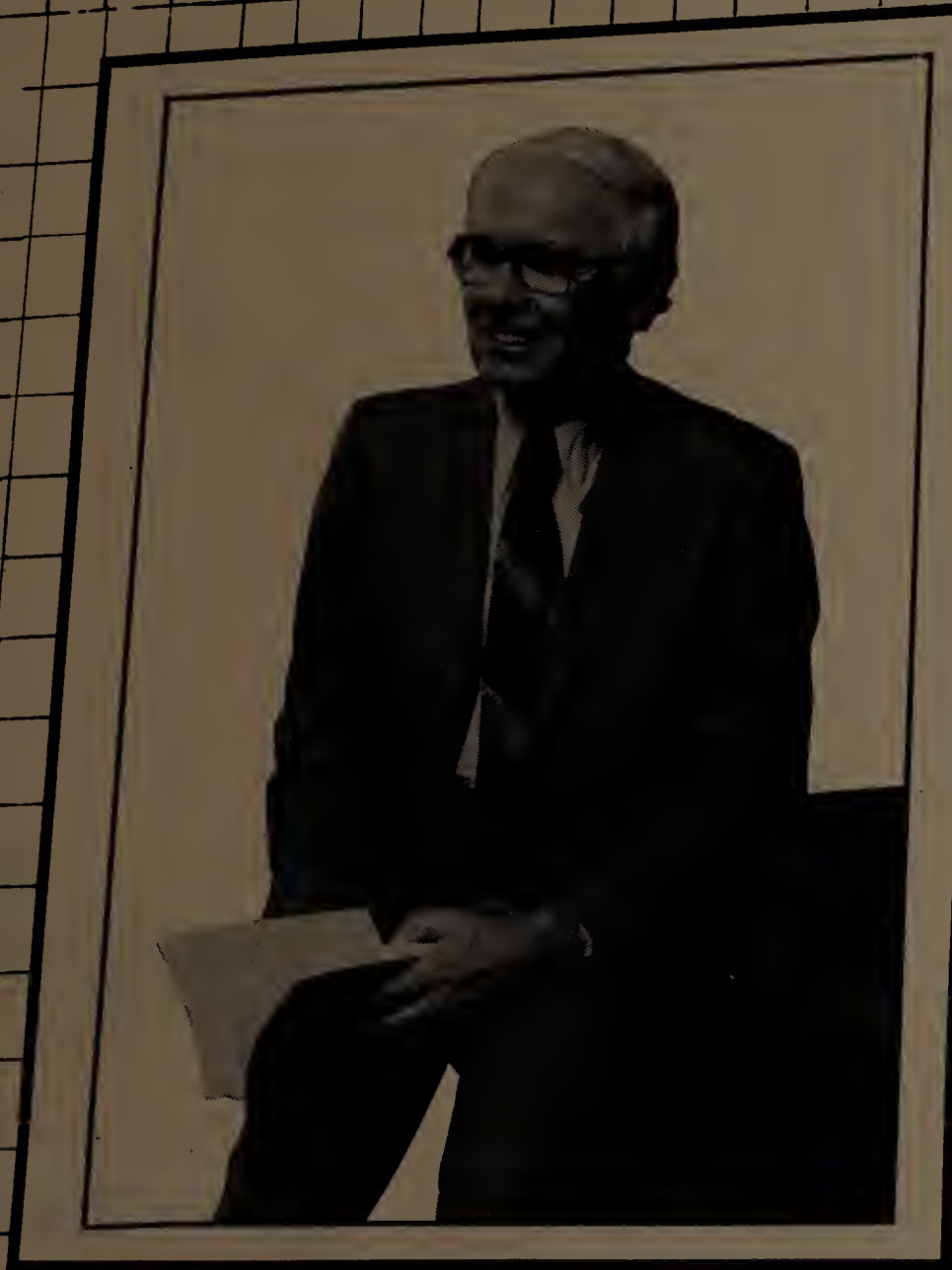
1957, Norris and eight associates left Sperry to form Control Data, the first publicly financed start-up in the computer industry. Shares were sold for one dollar to friends around Minneapolis. The new company targeted one market — large-scale computers for engineering and scientific applications. CDC grew and diversified by stages: First the company manufactured peripherals for its own products, then the OEM market. In 1962, CDC opened its first data service center, eventually hooking customers into the Cybernet data processing system. The inner-city riots of 1967 spurred Norris to build plants in disadvantaged areas, including the Northside of Minneapolis and Selby in St. Paul. In 1968, CDC acquired Commercial Credit Co., thus moving into financial services. For the past 20 years, CDC has been developing its Plato system for another new market, computer-based education.

Internally, CDC developed a hot line to help employees through crises. The Stay Well health program assesses a worker's lifestyle and encourages healthier living through courses, special lunches and fitness facilities. A St. Paul plant adapts to the schedules of part-time workers such as students and mothers. In hiring for one inner-city plant, CDC threw out the standard employment form which asked for references and past work experiences from habitually unemployed and imprisoned people. The new questionnaire required just the job candidate's name and a person to contact in case of emergency.

Despite his \$552,560 a year salary and substantial financial interest in Control Data, Norris lived in a modest St. Paul home for 25 years with his wife and eight children. Bowing to his wife's wishes two years ago, Norris agreed to move to a new home in suburban Minneapolis, but he insisted it be earth sheltered. He compromised and allowed windows at the southern exposure of this sub-ground home. A windmill heats the swimming pool. As for transportation between shelter and office, Norris reluctantly agreed to give up his aging car for a new four-door American model more befitting a chief executive officer.

Two weeks ago, Senior Editor George Harrar conducted the following interview with William Norris in his 14th floor office at CDC's world headquarters in Minneapolis.

IN DEPTH



September 12, 1983

IN DEPTH

Control Data employs 56,000 people and earns about \$4.3 billion in revenue per year. How do you reconcile the company's large size with your philosophy that small businesses function more creatively, if not more efficiently?

There are some things where size is advantageous, and I have no quarrel with that. On the other hand, it is true that large organizations are not as creative as small ones. We constantly struggle to have the best of both worlds. We try to stimulate creativity within the company. And then we have many relationships with small companies so that our people in working with them can be stimulated. Also, we get the benefit of the creativity of the small company. So, we're actually trying to get the best out of each.

Could the development of the Cyber 2xx have been done within Control Data rather than being spun off to ETA Systems?

The issue is not whether it could have been done, but how well it could have been done. You have to define what you mean by a supercomputer. My definition is that it is the most powerful computer that can be built at any given point in time. I believe that the creativity of a small company will more likely produce the most powerful computer than if it is done within a large company. I think also that it will be done faster in a small company.

What is the arrangement exactly? Will you be buying supercomputer systems from ETA Systems for resale, and ETA Systems will sell their computers as well?

Correct.

Does this move signal Control Data's exit from the supercomputer marketplace?

Absolutely not. It accelerates development of the next generation of machines to be offered.

You have been quoted as saying, "Whenever I see everybody going south, I have a great compulsion to go north." How has that tendency to buck the prevailing view affected your management of Control Data?

I think it's been a plus. I think that by having that philosophy you find opportunities that would otherwise be overlooked. So I think on balance it's been beneficial.

Have you made any very wrong decisions where you realized later that the way you were going was not going to work?

No, I don't recall any. I think that wrong decisions, or that is, decisions that don't work out, are usually more a situation where there wasn't dedication and aggressive implementation to be successful. There haven't been very many instances in Control

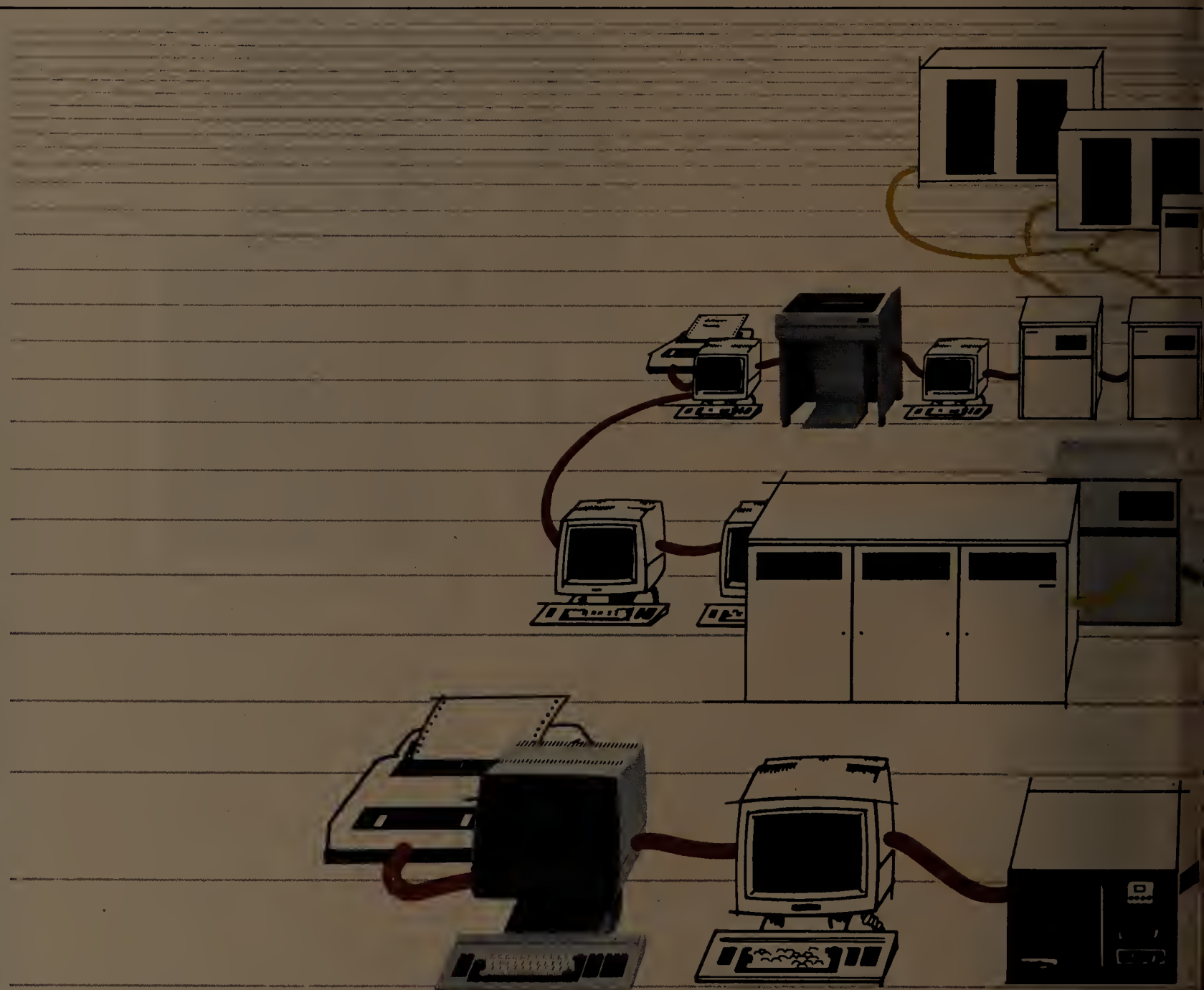
Data where there have been bad decisions. There have been many instances when it's taken longer or it's been harder. But we have a philosophy that after you embark on a path, you're going to stay on it unless along the way it is proven to be the wrong one for one reason or another.

I don't really recall any wrong paths, because when you look at our strategy, we're addressing unmet needs, major unmet needs, like education. No way that's going to be a

wrong path. The issue is traversing the path in the most expeditious way. Most of the decisions I'm involved in are more of that nature. So there are really not many opportunities for error. The error comes in not being able to implement efficiently.

Is Plato an example of staying to that course until you're proven wrong? Has Plato taken you longer to develop or longer to reach market than you expected?

One doesn't know when one starts on a path to develop a better educational system just how long it's going to take. I guess if you had asked that question when we started in 1962, I probably would have said that it wouldn't have taken 20 years. But it has, and . . . so what? It's a tremendously good investment. It's going to be the largest segment of our business down the road somewhere. So I'm very, very pleased with the results.



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IN DEPTH

How did you envision Control Data at its founding in 1957, as what kind of company?

A company that would do something significant in the computer field. I didn't have any particularly definitive notion of what it would be.

I recognized the computer field as offering many opportunities, and I just wanted to be part of it and do, as I say, some significant things.

'There are some things that I'd like to see put straight in this country. For example, hostile takeovers. I just heard about Wang trying to take over Tymshare, and that's just terrible.'

How would you characterize the company now — as a service company selling solutions?

Well, we're moving strongly toward services. We certainly sell a large amount of hardware yet, and

we'll continue to sell hardware, probably forever. But the major thrust of Control Data is services.

According to one survey, Control Data is the second largest American company still led by its founder. What makes you stay when others have either retired or looked for different challenges, for instance, in start-up companies?

Well, there are some important things to be done, and I just like to do them. I think that's one thing about Control Data that's different because of our strategy of addressing these major unmet needs as profitable business opportunities. It's very complex, it takes a long time, and there's work to be done yet.

Did you consider at any point leaving Control Data?

No, not at any time have I considered leaving Control Data. And as long as I can contribute, and I feel that I am contributing and I feel rewarded — and, of course, the board of directors feels that I am contributing — I'll continue to work.

I have some very interesting sidelines. I have eight children, and we're engaged together in starting up a number of small businesses. Those are very challenging exercises. At the moment, that would be the only reason why I might consider retiring — to devote more time to those activities.

So you don't have any time frame for retiring?

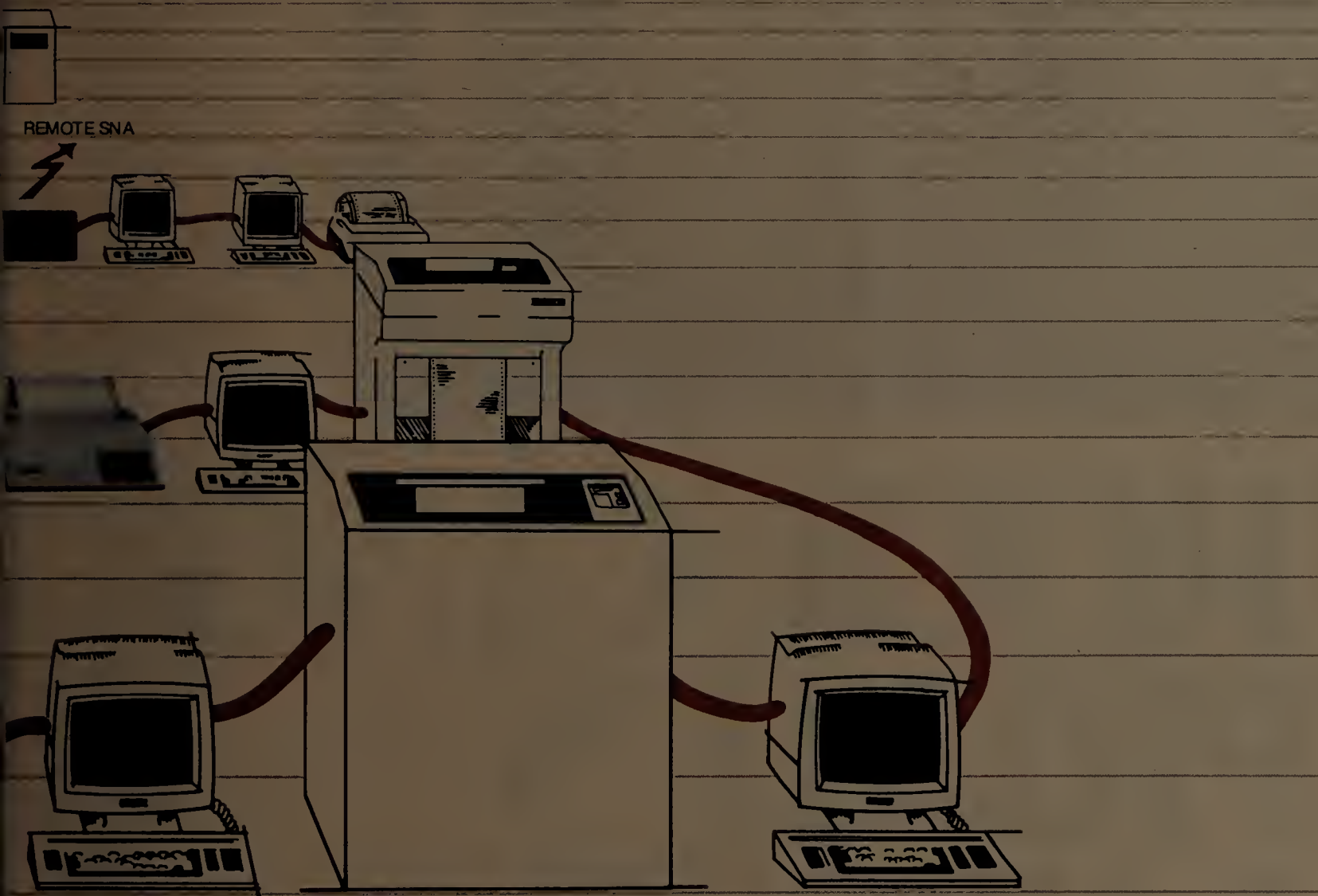
Correct. There are some things that I'd like to see put straight in this country. For example, hostile takeovers. I just heard about Wang trying to take over Tymshare, and that's just terrible. It makes me sick to my stomach. Why the hell do they have to be off on that? I also feel strongly about technological cooperation, and I'm heavily involved at the state level and at the national level. I have a lot more leverage as the chief executive officer of Control Data than I would otherwise. So that's another reason.

What particularly bothers you about Wang possibly positioning itself to acquire Tymshare?

Well, it's damn thuggery. How can you justify going after somebody else's business just 'cause you want it? Would you like it if you were running Tymshare and some thug came up and started beating on your door to take your company over? It's just destroying the very essence of private enterprise. Here on the one hand we have to work more closely together, and on the other hand, a company is preying on another one.

I spent the last 20 years, in addition to a lot of time on computer-based education, in advocating more cooperation. The Japanese are beating the hell out of us, and one of the reasons is that they work together.

(Continued on In Depth/9)



four distinct controllers—and multiple coaxial links of up to 10,000 feet each—to any of those LANs.

Imagine the economies of a system that handles that networking with standard 3270 coax. That requires no commitment to special architectures or non-standard LAN technologies. And that, thanks to a multi-drop, station-to-station design, can eliminate thousands of feet of new coax.

Of course, such a system would have SNA compatibility. But it would also have a set of capabilities to dramatically increase efficiency and throughput, while reducing hardware configuration and support cost in any environment. Capabilities like multi-host and multi-personality support, application and address switching, session swapping and system printing.

This system would have an IBM-compatible personal computing option "built into" the network, not "bolted on" at the workstation—an option that would let you assign true 16-bit computing power, maintain overall MIS control, and share expensive resources, like hard disks and letter-quality printers.

Such a system would offer a full range of printers, including matrix, correspondence, and high-volume, high-speed models—all designed for maximum efficiency

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IN DEPTH

The Quotable William Norris

When my class got out of the university, people looked at us as if we were crazy when we asked for a job ... I was luckier in one respect: I went back to the farm after my father died. That was an enormous struggle. All of these experiences gave me a good sense of how it felt to face not

being able to get a job. (*U.S. News & World Report*, Sept. 21, 1981)

I'm not a philanthropist. I see opportunities to make money in the inner city. These people dislike philanthropy as much as I do. (*Chicago Tribune*, Feb. 21, 1982)

The very fabric of our society is gradually being torn apart. Inevitably, the point will be reached where social order is threatened. Speaking strictly in terms of business responsibility, management has an obligation to do what it can through its business policies to correct or relieve condi-

tions inimical to the long-term viability of the enterprise and the environment on which it depends for its very existence. (*Directors Publications*, February 1982)

Our people stay with us because we have better programs than other companies. I may be a tough manager, but I'm a caring manager. You have to motivate people, but you have to act with compassion, too. (*Omaha World-Herald*, Aug. 9, 1981)

We've been successful because we've been willing to accept lower short-term returns on investment in return for substantial long-term opportunities. (*The New York Times*, Sept. 13, 1981)

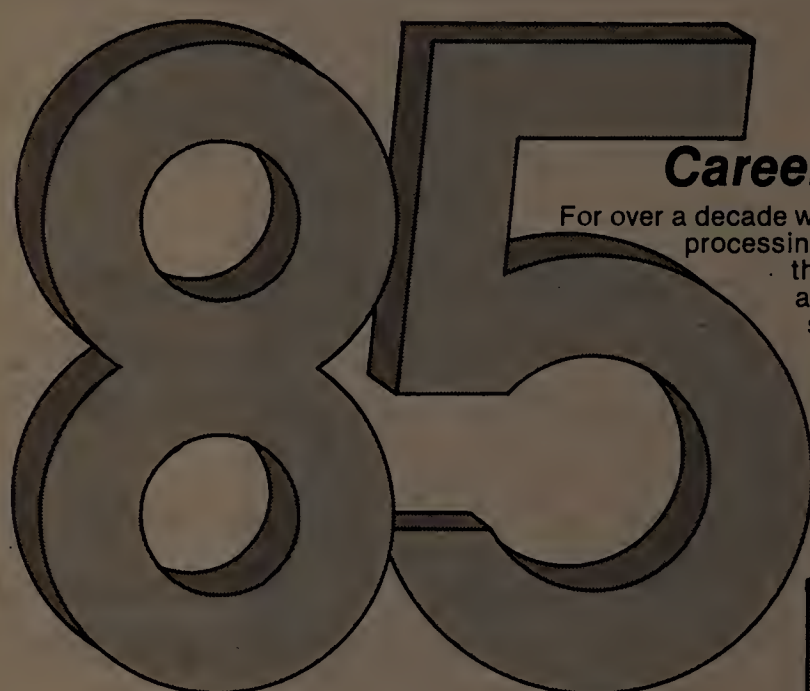
For every corporation to rediscover what others have already learned represents waste of the most pernicious sort, not only to each company, but also to society. (Speech, MIT Alumni Club, April 28, 1983)

No country today can afford to be self-sufficient in technology — even the United States ... While administration of a planned, equitable program of technological cooperation and technology exchange would not be simple, it is doable ... Let us take a firm but constructive stand now to establish an equitable relationship with Japan while there is still time. (*The New York Times*, July 24, 1983)

I was called a freak and a do-gooder with a lot of money, and my sanity was questioned. (*The Globe and Mail [Canada]*, Oct. 31, 1981)

I can't count the times I've been called crazy. (*Country Journal*, August 1981)

This company will be roaring into the 21st century in high gear. (*Minneapolis Tribune*, Sept. 5, 1982)



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(Continued from In Depth/5)

They make better use of their resources. And this is the single most important thing that the United States can do to counter them. But no, they [American companies] have to go off and attack each other. And meanwhile the Japanese eat us.

Has Control Data been the object of takeover bids?

Nope, and I certainly think anybody who tries to take over Control Data is going to have one hell of a fight on their hands.

Are you the major reason that Control Data hasn't been the object of a takeover?

Oh, I think there are several reasons. One is that a lot of companies think our strategy is not sound; I think that has been some protection. And you notice that the companies who are the objects of takeovers are the more attractive companies. Well, you know, we're kind of a nondescript sort of thing that nobody really understands, so we haven't been, maybe, the choicest of targets. But that can change. Control Data's future was never brighter. And if somebody figures that out and tries to take us over, well, there'll be a real fight, I'll tell you that.

Do you relish this position — being a misunderstood company? You understand where Control Data is going, but Wall Street, for instance, has held a much different view over the years.

That's fine with me; I've never lost any sleep over it. I can't say that I particularly like it, but on the other hand, like I say, I'm not suffering as a result of it.

You have mentioned unmet social needs. The 1982 annual report says it is "basic corporate strategy to address unmet social needs as profitable business opportunities." Can you describe how your social views affect how you do business in the supercomputer area, the peripherals area or computer service areas? How is your social policy evident there?

Well, it's the same way; we don't make any distinction. In fact, we don't have social projects, we have only business projects addressing unmet social needs. So there really isn't any difference in any part of the company. The same policies apply in peripherals, computer systems . . .

That means in terms of who you hire and where the plant is located?

Yes, right. We have inner-city plants that make components for computer systems as well as computer peripherals. In fact, most of the inner city plants — plants in poverty-stricken areas — are in the peripheral part of the business, come to think about it.

The peripheral equipment sector was particularly hard hit last year, contributing to an overall net earnings decline from \$171 million to \$155 million. What new products this year do you expect to have a significant impact on profits?

There are something like 15 new products, I believe. At NCC we announced Cricket, which is a 3.5-in. Winchester disk drive, an 80-mega-byte model in the Wren 5.25-in. Winchester family and a 14-in. Winches-

ter that is the largest capacity OEM drive from Control Data.

Cricket is a wonderful product. It's very important in computer-based education to reduce the hardware cost. Cricket is a good example of that. It's a very low-cost disk memory, and because of Cricket, we're going to be able to open up the developing-country market sooner.

It was a situation in peripherals last year where the market softened, and we were just caught in a down

cycle as far as new products are concerned. The two together depressed earnings abnormally.

If your social policy —

We don't really have a social policy.

Your business policy —

Right, our corporate strategy.

Corporate strategy, OK. If it's so

together we could create a symphony



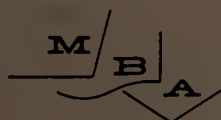
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IN DEPTH

good for Control Data, why haven't many other companies copied it?

Oh, I guess you could answer that in kind of a flip way. If the Japanese approach is so good, why haven't other companies followed their lead? They will, just like you see companies now trying to copy many of the techniques that the Japanese have

used successfully. You'll see the same thing in the case of Control Data's strategy.

A more thoughtful answer, however, is that it's more difficult. All of these projects are done in cooperation with other sectors — the government, communities. When you put a plant in a poverty-stricken

community, you just don't go in there and build the plant. You have to meet with the community and work out many, many areas of understanding, get their support and help as you go along. That's difficult. They'll probably call you a few dirty names when you first approach them, because you're suspect. Well, that's unpleasant. Most pin-striped executives — they're not used to that. So, it takes a little getting used to.

And then, when you go into a cooperative effort, that means you have to have agreement. That's hard, it takes time. But once you have that agreement, the results are invariably better. Then, too, the payout is longer, and many companies find that difficult to manage.

Nowadays, Wall Street looks for earnings increases each quarter.

Right.

If a company doesn't show increases, the stock falls quite rapidly. It would be a problem for that kind of company to do business...

That's a problem we've had as well. We survived it.

Tom Watson Jr. was called by *Fortune* magazine "the most successful capitalist who ever lived." Is that a description you would have liked applied to you? Are you cast in the same mold?

I don't know about the same mold, but I wouldn't be angry if somebody said that about me; I wouldn't resent it. But on the other hand, I'm much more interested not in how successful Control Data might be, but how successful we are in solving these very, very serious problems on a cooperative basis. If I could put on my tombstone something that said, "He worked like hell to foster cooperation," I'd be happy.

How would you assess Control Data's meeting your goal of cooperation?

It's doing very well. Control Data is the most cooperating company in the world.

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No, I think Control Data is great,

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and I'm very fortunate to be a part of it. When good things happen to you, you always have to figure there's a lot of luck involved. Control Data was started up in an environment that was conducive for it, whereas it would not have been so 20 years earlier. Our timing was good, the opportunity was there, and there were some very, very wonderful people — wonderful in the sense they were people with compassion but also people of great ability. So this has all come together into a great company.

Anything you would have changed in the past 26 years? Any different areas you would have gotten the company into or opportunities missed?

I don't believe there are any. I don't wake up in the middle of the night and say, "Oh boy, I wish I'd have done that." There are probably some areas we should have gone into sooner, but I don't worry too much about the past. I worry about the future.

We talked about Wall Street misunderstanding Control Data. A couple of examples are moving into the peripherals area, or filing the antitrust lawsuit against IBM in 1968. Has Wall Street's attitude hurt Control Data?

Have I hurt Control Data?

Has Wall Street hurt Control Data?

You can't find much evidence that is true. We've done fairly well. We've always been able to finance the company from time to time. We enjoy a lot of market acceptance. We have a lot of very supportive stockholders. So if Wall Street has hurt Control Data, I'm not aware of it to any great extent.

So you haven't spent much time trying to change the minds of Wall Street analysts?

No, no.

You talked about cooperation between companies and also cooperation with the government. Is government involvement necessary in the development of supercomputers?

Yes.

What kind of involvement would you like to see?

Several types. The supercomputer industry came into being because of government-supported research and development in the ear-

ly days. And when that government-sponsored work tapered off, then progress in the supercomputer field slowed. So, direct R&D support. Second, the government could purchase the ma-

chines and put them in universities to develop people who are knowledgeable about supercomputers.

Also, the government could provide a market. Mostly small companies

have built the supercomputer; it hasn't been big companies. The market isn't large enough, so the total return isn't attractive. That being the case, then, the government should buy early

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IN DEPTH

machines in order to do two things — share the risk and provide market support.

So you want the government to provide financial support for research into su-

percomputers and then provide a market for you to sell them?

And also, to put them into universities to provide that market via making funds available to universities,

who in return can use the computers and develop programming, and so forth.

Would this set-up keep government bureaucracy and red tape away from the

project?

Right, just put the money in.

How do you justify the government's support of supercomputer development,

an area Control Data is heavily involved in, as compared with an area that another company is involved in, such as microcomputers? Just for the strategic importance of supercomputers?

Yes, the strategic importance. Supercomputing is out on the leading edge of scientific inquiry. As a matter of fact, one of the reasons, I believe, that our scientific effort has slowed, vis-a-vis other countries, is that the other countries have bought more supercomputers. If you look at the sale of supercomputers, up until quite recently, you'll find that most of them are going overseas.

Supercomputers are not the result of a heavenly conception. They simply cannot be designed, developed, manufactured and brought to useful application in society without a vast underpinning of research and advanced technology.

Technologies that are vital to supercomputers include thermodynamics, surface analysis, mathematics, material science, device physics, very large-scale integrated circuits and sophisticated manufacturing technology, including robotics, computer-aided design software, and the list goes on.

In other words, the supercomputer is the result of a vast spectrum of interdisciplinary research and advanced development work. The supercomputer, in turn, is a vital tool in the conduct of that research and the derivation of those technologies.

Within Control Data, for example, two Cyber 205 computers are at work around the clock, assisting our design engineers on the development of successor products.

It follows, then, that any discussion of a fertile environment for supercomputers must deal in part with the more general requirement for technology development, application and leadership in a broad spectrum of disciplines if we are to remain technological leaders in supercomputers.

Will the 2xx be equal to or better than what Japanese companies will produce in the mid-'80s?

Oh yes.

You have no doubts about it?

No doubt about it. They don't have the experience,

You can call them, them, them, them and them.

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US
LEASING

IN DEPTH

they don't have the expertise, particularly in the software area.

Will Control Data supercomputers also be the best this country produces, better than Cray?

Yes — you're talking about ETA systems now. Seymour is going to have to scramble.

The reason for setting up ETA Systems is to take people such as Lloyd Thorndyke, Neil Lincoln and other executives in the supercomputer area and put them into an environment in which they...

... can go for broke. And in the process, they'll build a better machine sooner. Supercomputer product development is best done by small engineering teams working in an environment uncluttered by bureaucracy. The small company undoubtedly is the most conducive environment for such development. It is entrepreneurial. It is dedicated. Its personnel have fortunes to gain from success and bankruptcy to face from failure. There is no better motivation for hard and creative work.

Unlike many chief executive officers or chairmen of large companies, you are quite visible and outspoken. Have you faced criticism that your attention should be directed more internally, into the workings of the company, rather than talking to the country?

As a matter of fact, it was just the opposite. Security analysts used to bitch at me and say, "Well, you know, he'll never let go. Why doesn't he let some of the younger guys run the company." So I did that. I spend most of the time on outside matters and long-term strategy, while others are running the company.

When did that change take place, or did it evolve?

It evolved, but it started seven or eight years ago. That was one thing I did that the security analysts wanted. And I ought to get recognition for that.

Would that be the only thing you did...?

Probably.

How would you characterize your management style?

Well, it's hard to boil it down to a few statements, but I think above all else is delegation of responsibility. I don't turn my back, but I still let people fail or succeed on their own. On the other hand, if they're on a path of failure, I try to help them to succeed. I think another thing that's been very, very important is that I've never, never, never criticized an executive for missing a deadline on an advanced development project or in one of these new fields, like in Plato, unless there was bad management or

'I think it has been very important to get people to undertake some of these long-range projects where the outcome is very uncertain or even the method of implementation is uncertain.'

obviously poor judgment.

But if it were just a question of underestimating or unforeseen prob-

lems coming up, I have never been critical of people.

I think it has been very important

to get people to undertake some of these long-range projects where the outcome is very uncertain or even the method of implementation is uncertain.

You're more interested that the project turn out correctly rather than come in on time?

Right. That doesn't mean we don't have budgets and time constraints and don't talk about them, but we

HOW TO GET A NETWORK OFF THE GROUND.



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Say you have a small minicomputer network. A dumb terminal here, a dumb terminal there, and a DEC, HP, Data General or some other minicomputer miles from either. They're probably joined by modems and phone lines. But that's no way to run an efficient, economical network. And it doesn't give you any room to grow.

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IN DEPTH

don't chastise people for shortfalls for which they can't be held completely responsible.

Has your management style changed appreciably during the last 26 years? Is working for you now the same as working for William Norris a couple of decades ago?

You would have to ask other people.

Control Data has instituted a number of programs for employees, such as the hot line, Stay Well, flexi-time and a justice system for resolving grievances. How far should American companies go in providing a work place that meets more than the minimal needs of its workers?

Those are good examples of what should be done universally. Those

'About every company is selling the same kind of a product, using the same base technology, the differences being in some of the bells and whistles. It always seemed to me that it was an unjustified waste. So, I started talking about cooperation, and it took eight years before I could find the first taker, NCR.'

are all good investments. You get a return on the cost.

Can you point to decreased turnover and increased productivity? Is that something you've measured?

I don't know if we've ever measured it.

But it's your sense that these programs bring a return. What kind of

return?

For example, the hotline. I can't remember the numbers on that, but we got the investment on that back in just a few months. The savings per year are fantastic. People who have come back to work sooner or we avoid lost time and so forth. Plus the the well-being of the employee, which you can't put a number on, but you know it's there.

So your feeling is that people working at Control Data find it a good place to work.

Oh, there's no question about that. I get many, many letters in that regard from people who are appreciative of the facilities we have, particularly Stay Well and the hotline.

Are there other programs coming up that you might start?

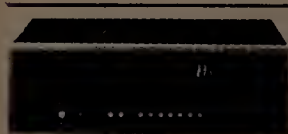
I don't know of any right now. The one on employee justice is fairly new. We can see a marked decrease in the number of cases that we get involving disputes and so forth. There isn't any question that it's very effective. And again, if you can avoid a formal dispute, who knows the value of that? Certainly very great, in that it makes for better relations.

Henry Ford took a paternalistic view toward his workers, in terms of the employee programs he instituted. Are you part of that tradition?

I don't put it in terms of taking care of the employees. I think it's more in terms of fair treatment, which includes many aspects, not just salaries or means of employment, but many other factors.

How did the idea come to you to form a research and development cooperative which evolved into the Microelectronics and Computer Technology Corp.?

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PCI 1076
Get ASCII to SNA/SDLC 3270 emulation with money to spare. The 1076 makes ASCII CRT's appear as 3278's to SNA/SDLC hosts. Personal computers can function as 3278's; attached printers look like 3278's.



PCI 1067
An SNA/SDLC to ASCII converter for 3767 emulation. An alternative to Network Terminal Operator, the 1067 is all that's needed; it's the "Catch All" for ASCII to SNA/SDLC.



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A BSC to ASCII protocol converter for 3271 emulation. It's designed for companies with Bisync who want to use ASCII devices in their networks now, but may want to upgrade to SNA/SDLC later.



PCI 71B/SNA
A BSC 3271 to SNA/SDLC converter for 3274 emulation. It eliminates the need to buy new SNA/SDLC CRT's or controllers, thereby giving new life to Bisync investments.



PCI 1051
An ASCII to Sys 34/38 protocol converter. Expanding the System 34/38 terminal network used to be an expensive proposition. Not now, with the help of the 1051.



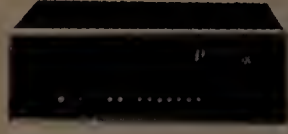
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meet with potential customers one-on-one and the simple tabletop displays keep exhibit costs at a minimum.

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I've been working on that concept for 20 years. It came about for a number of reasons. Control Data was always small compared with its competitors. For example, in the early days of Control Data, there were large European companies that were in the industry: Siemens, Philips and so forth.

And so it was a matter of survival to an extent, because we lacked the enormous resources. On the other hand, if we could leverage ours through cooperation, that would be very advantageous for us.

And also, the fact that there's been an enormous duplication of R&D in the computer industry. About every company is selling the same kind of a product, using the same base technology, the differences being in some of the bells and whistles. It always seemed to me that it was an unjustified waste.

So, I started talking about cooperation, and it took eight years before I could find the first taker. That was NCR, and we set up Computer Peripherals, Inc. to manufacture high-speed printers, magnetic tape systems, disk memories and related products.

What year was that?

That was 1972. Then a few years later — Magnetic Peripherals. Meanwhile, I spent an enormous amount of time in Europe trying to get cooperation started on a broad base. Had that happened, the whole course of the computer industry in Europe would have been very different. They would have been in the ballgame today, whereas, they're pretty much out of it.

Who were you talking to in Europe, specifically?

You name it, I talked to them. The chief executive officers of Siemens, Philips, ICL, Plessey.

You were asking these companies to join in a kind of cooperation that...

...MCC is now doing.

It hasn't been a tradition in

American business to cooperate.

That's right. And I felt that maybe I could be more successful in Europe because they were having more problems than here in the United States. But each of those large companies thought they could go it alone. Well, they haven't been able to do it alone.

Is MCC, as it's starting up now in Austin, Texas, fulfilling your vision of it?

Yes. It's just unfortunate that it took so long to get it going.

You obviously get very upset discussing the Japanese, their manner of doing business. Does that feeling stem from Control Data's trying to crack the Japanese market in computer services and taking so long to do it?

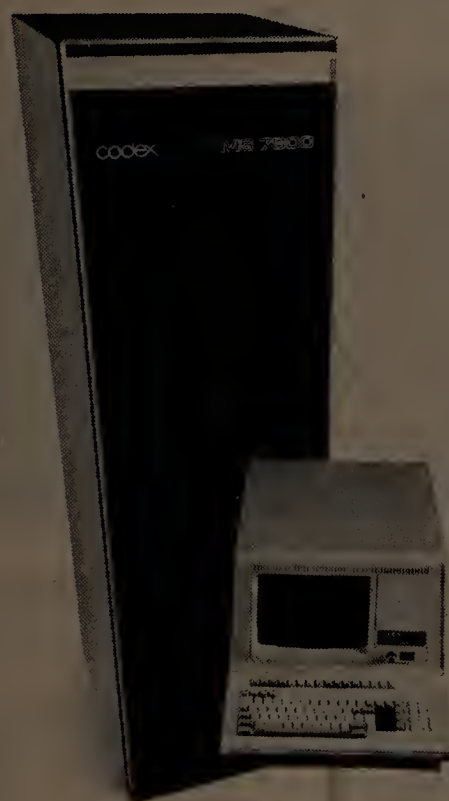
That's one reason, and being unfairly delayed. You may have read my article in the *New York Times*. But

it's more than that, looking at it from a national point of view. We're simply not being given reasonable access to the Japanese market, and it's hurting the United States. Therefore, we need to address that.

What do you suggest be done? Would you take trade measures against Japan?

No, I wouldn't, that's difficult. What I suggested in the *New York Times* article — the thing the

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Japanese lack is advanced technology, and unless and until they provide us equitable access to their market, then I would control their access to our advanced technology.

What kind of advanced technology are you talking about?

Technology that's in universities, large companies and small companies: for instance, vertical recording. The technology for vertical recording came from the University of

Minnesota. The Japanese are using it. That's the type of technology that I would restrict access to.

That would take legislation?

Yes.

Have you proposed that kind of legislation?

Yes, I'm working towards that. It's very doable because the U.S. government is now doing that in connection with Eastern countries.

How is Control Data doing now in Japan's computer services market?

Better, but we earlier tried to get into the peripheral OEM market in Japan and lost a lot of money and had to back off and start over again. We had a joint venture with a Japanese trading company, and it didn't work, and the main reason it didn't work is we just couldn't get access to the market.

You mentioned the Plato educational system as the next big profit area. What other areas do you expect to be particularly profitable?

Stay Well, a whole host of small business services which includes Plato. Plato permeates practically everything.

The \$900 million figure is often used to describe your development costs — is that a good estimate?

It's been more than \$900 million now. That includes research and development. It also includes market development. It's the innovation cost of Plato.

Your book, *New Frontiers for Business Leadership*, was just published. What is its focus?

It's essentially explaining how our strategy is applied of addressing society's unmet needs as business opportunities in cooperation with other sectors.

Can you describe the founding of the company, the selling of shares for a dollar to friends, how you got financing?

Well, we sold \$625,000. It was slow to get under way. People had difficulty in understanding what the company would be doing. However, it's like sheep going over the cliff: You get one to and the rest of them will follow.

Did you phrase it like that at the time?

Yes, oh sure. I told people that there was risk involved in this. That if they put their money in and it didn't work out, don't come crying to me, because I'd be feeling bad enough about losing my own money, not theirs.

But what really helped to get it under way — I had a doctor friend and told him about it. He came here and in order to explain what I was doing, I showed him a Univac computer. He said, "You mean that's what you're going to be doing?" And I said, "Well, not exactly, but that's the field we're in."

So he invested \$25,000, and I always told him I felt like selling him the Brooklyn Bridge.

Given the fact that I was willing to put in \$75,000 and here was another person with \$25,000 — zip, it just all went real fast. In fact, there were quite a number of people who were angry with me because they didn't get stock.

Relatives?

Well, no, friends. I had a dentist whom I regarded very highly and I didn't want him to have any stock because if it didn't work out, I might have been out a dentist.

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Chicago October 31-November 3, 1983

San Francisco December 5-8, 1983

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Information Center Software Selection Shaku Atre

Washington, D.C. October 24-26, 1983

Ms. Atre will describe methods and tools that allow end users and data processing professionals to work toward a mutually beneficial and productive Information Center. Commercially available products to support Information Centers will be reviewed and compared. Such products as fourth-generation software packages, decision support systems, text processing systems, query languages, and report generators will be covered.

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FUTURE SMART

By David B. Powell

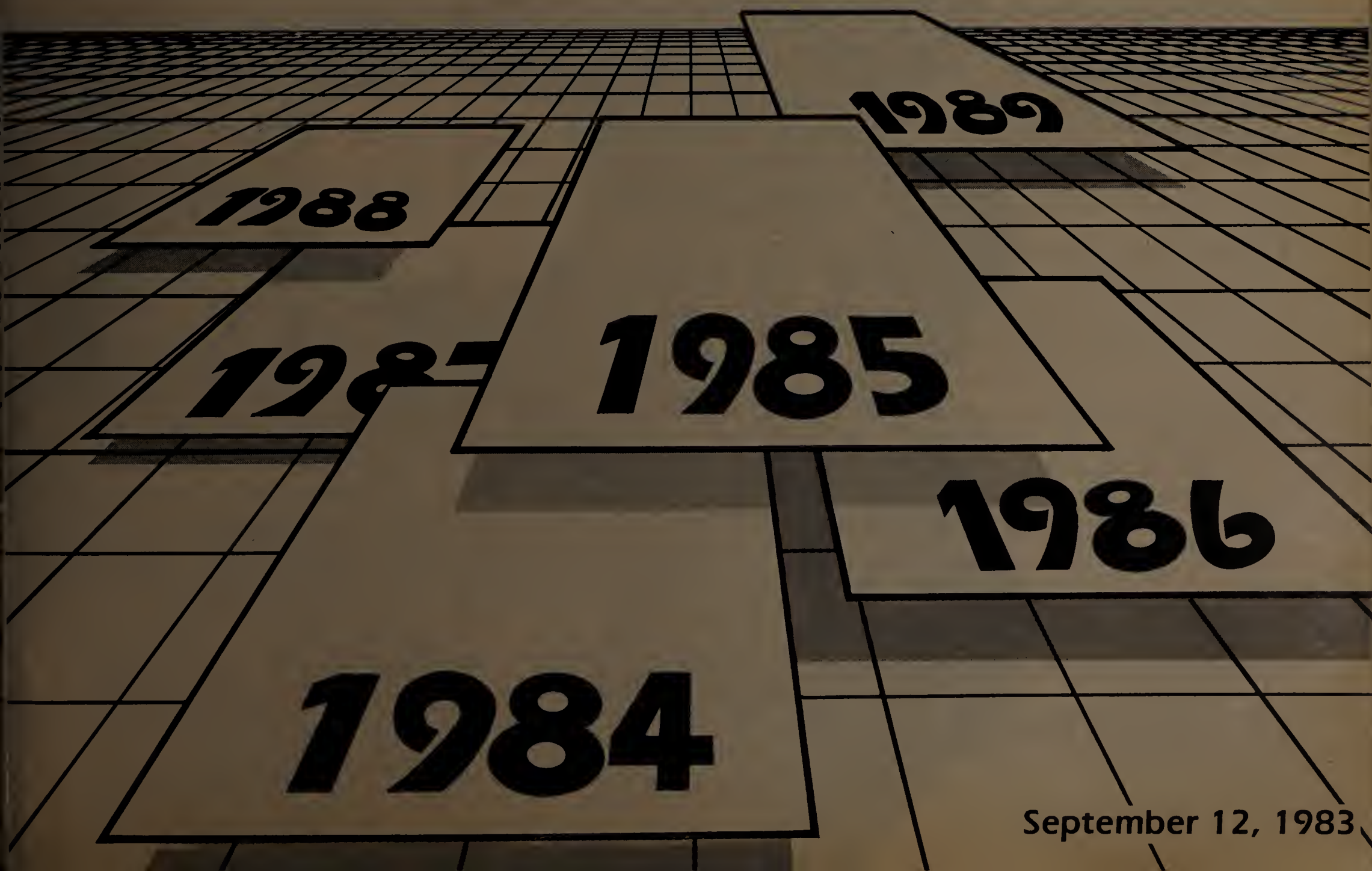
Users, vendors, entrepreneurs and venture capitalists all need information about the future computer world to keep their businesses on the right track today. How will the industry look five or 10 years from now? What new technologies will emerge and survive? Who will be selling what products, at what prices and in what quantities?

The people with an inside line on the answers are the industry's forecasters — market analysts, researchers and futurists. Their names and claims appear each week in the business and trade press: firms such as International Data Corp., Arthur D. Little, Inc. and The Yankee Group; individuals such as James Martin, Amy Wohl, Portia Isaacson and Charles Lecht. How do they turn their knowledge of the present into a vision of the future?

"The process of forecasting has many elements," explained Paul Nesdore, group managing editor for international publications at Datapro Research Corp. "It's all so fuzzy. One element, of course, is published research statistics. But even these figures vary. For example, how many software packages are out there now — 15,000, 35,000? Try to project the future based on what you don't know now!"

Prognostication is a "no-lose business," according to Nesdore, "unless you specify figures or attack sacred cows."

Talking hard figures (rather than vague ranges) can leave an easy record for a critic to spot a blatant error. But in most cases there are no critics. The forecaster can safely predict the market as he sees it, knowing that years later, no one will



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GLOSSARY:

ASCII (American Standard Code for Information Interchange) The language spoken by most Personal Computers.

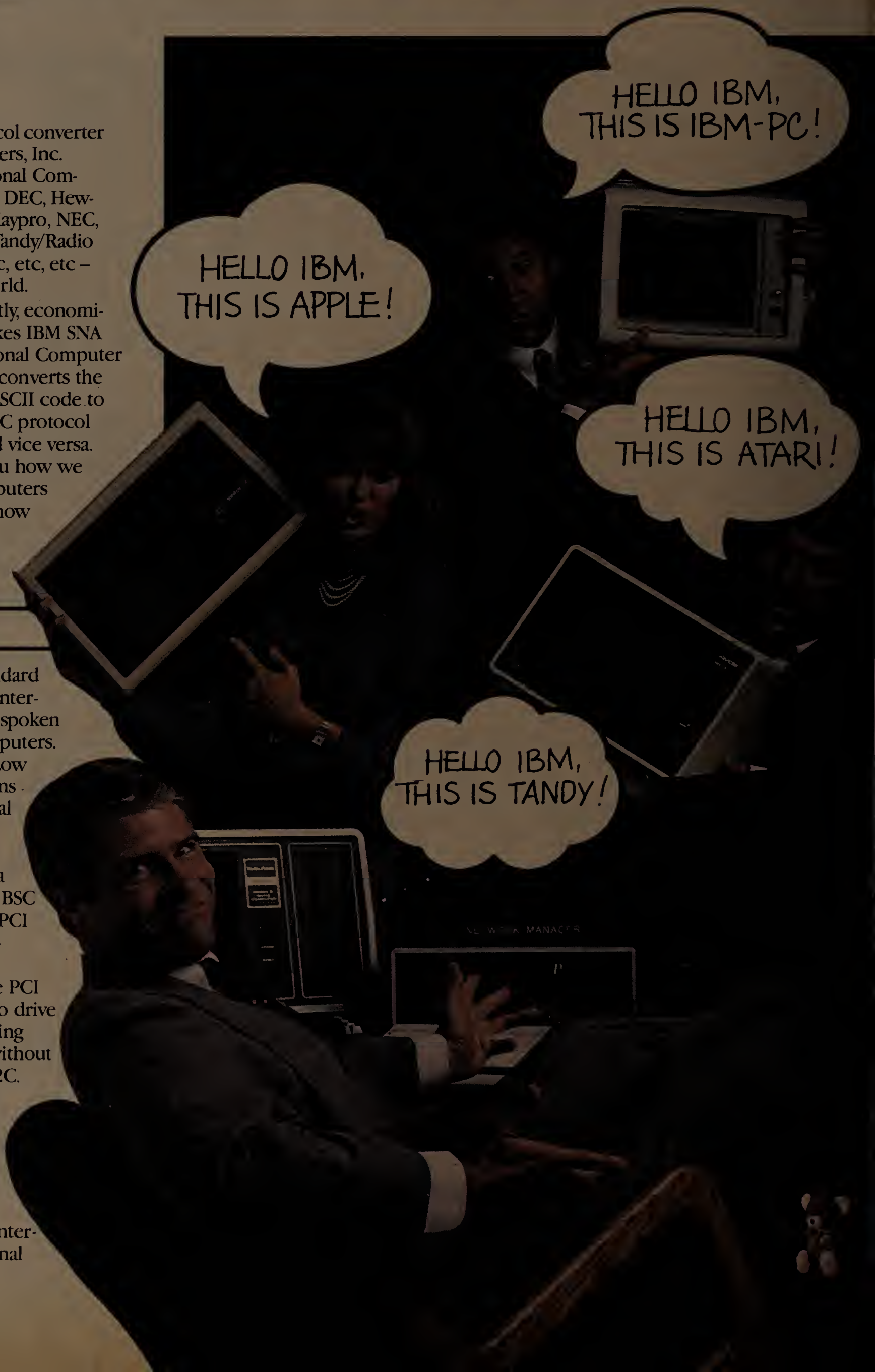
ASYNCHRONOUS Low speed, low cost modems used with most Personal Computers.

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3274/76 IBM controllers which support 3278, 3287 devices in an SNA/SDLC network.

3278/3287 IBM's CRT; IBM's printer.

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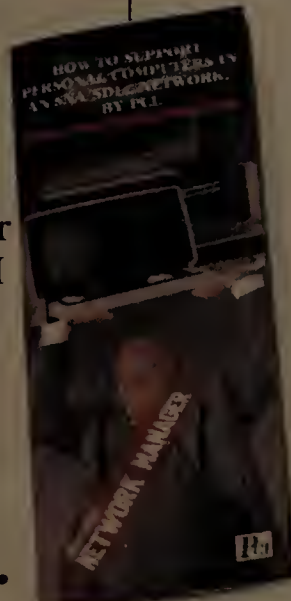
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IN DEPTH

check up on him. Before the specified forecast time is reached, the prediction is forgotten as clients clamour for the next two- or five-year prognosis.

Perhaps the analyst/forecaster's best guide through an unclear world is intuition based on experience, according to Nesdore. "There's something indescribable — a feeling you get after reading numerous articles and attending shows. You get a feeling, an emphasis, in the back of your

mind. Then you read more articles, which support or deny your views. You start to focus, making guesses along the way, sifting out what is no good. It's tricky because vendors and journals all have biases. You get some facts, some bias. Then you see a pattern. Often you come up with conclusions that seem opposite to popular opinion or trends. Then you see if your predictions materialize.

"Anyone in this business would be a liar if he said he didn't work this

way some of the time. We all look for statistics that justify our intuition."

Today's rate of technological change causes as many problems for futurists as consumers, according to Tom Elliot, associate/acting director of research, office automation, for International Data Corp. (IDC). "But another major problem is the relative youth of our industry. We don't have 30 years' worth of historical data at our disposal. The industry is still evolving. For example, look at what's

happening to the universe of computer users. You're getting things like home markets for computers. Imagine you were a market researcher in 1883, and somebody asked you what the market would be for home use of telephones. Predicting the effects of today's personal computer trends is almost the same kind of thing."

"We just don't know very much about why people buy a product," he continued. "We're finding out more every day, but we are now on the edge of a totally different world of DP users. That makes life hard."

Constant Fine Tuning

One way IDC tries to keep its projections on target is through rigorous application of hindsight, according to Elliot. "For our general processor forecasts, we go out five years. In addition, we are constantly getting better information about years past, which we're always using to readjust current projections. We have a good body of trust with computer vendors; they pretty much tell us the straight story. So our readjustments are typically very minor."

Elliot indicated that projection horizons must depend on the specific technologies involved. "We routinely like to do five-year projections. That's sort of a conventional forecasting period. However, in a rapidly developing market like personal computers, that's too far ahead." He admitted that IDC once projected "a little bit under" on the growth of desktop computers, simply because it had made its projections before IBM jumped into the market. "That really altered the picture," he said. In more mature product sectors, such as mainframe processors, historical data helps produce "a fairly good fix" on the future, he added.

Wendell Jones, western region business manager for Arthur D. Little, often helps personal-computer and biotechnology firms develop entry strategies into identifiable market "holes."

"Because of the tremendous growth in the personal computer industry, we don't see much call for projections beyond five years," he said. "But even a five-year projection can be a real problem, because in this industry, there is an abundance of raw data but few interpretive mechanisms drawing meaningful conclusions from it. So I try to keep in personal touch with the personal computer market by visiting a lot of companies, making telephone calls and mailing surveys — just to keep an eye on what the companies are doing."

'Activist' Role

Howard Anderson, president of the Yankee Group, prefers the designation "market analyst" to "futurist" because his "window to the future is only short- to medium-term. I can tell you what you should be doing within the next two years, and I can

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still help a bit within the next five. After five years, it's a gray cloud out there.

"At The Yankee Group, our goal is to understand what technology our client is going to need, to recommend it and help implement it in the most appropriate form. This goal is sometimes difficult because technology always seems to move too slowly for the vendor and too fast for the user. So we have to anticipate, to decide which technologies will be important to our clients over, say, the next year, research it and make our recommendations."

Anderson added that since many Yankee Group clients are themselves DP suppliers, his firm often plays an "activist" role by recommending technologies that users want and need or by increasing market demand through purchase recommendations. "In some cases, we almost insist that vendors make products the market demands. We're not too shy about it. For example, we feel the market for digital PBXs would have taken another five years to get where it is, had we not told our largest clients they needed this technology."

Of course, like a self-fulfilling prophecy, such activism improves

one's chances of being right in the long run. However, for that very reason, this type of new front-lines role may be increasingly necessary.

Anderson illustrated using an experience with IBM's Systems Network Architecture (SNA). "About two years ago, after surveying large IBM shops for about five years, The Yankee Group concluded that Systems Network Architecture was in place, was improving and would become a de facto standard. This survey was based on some 2,500 to 3,500 key IBM users. They are our friends, they tell us what they are going to buy and why.

"Now, at about the time we released our SNA report, a well-known DP publication came out with the most hilarious article I've ever read — one saying that SNA was dead," Anderson recalled. "The publication, of course, was dead wrong. So we had to convince our user clients that the magazine didn't know what it was talking about and that the users should plan to build SNA environments. Second, we had to convince minicomputer-manufacturer clients that if they wanted to compete in an IBM environment, they'd better have an SNA box."

Horizons Closing In

As their job becomes more difficult, the forecasters are becoming more cautious. "One reason is that the future will be far more different from the present than the present is from the past," explained Edward S. Cornish, editor of *The Futurist* magazine and president of the World Future Society. "Futurists' methodologies for forecasting have certainly improved, but I doubt they have kept pace with the increasing speed of social change."

Since 1971, the society has allowed futurists from all fields to meet and exchange views on their work. In these meetings, Cornish has noticed one strong response to future uncertainties: Prognosticators have begun to "reel in" their prediction horizons.

"In the World Future Society's first general assembly in 1971, the theme was 'Dimensions of the Future.' We were looking at the future in all its aspects. The sky was the limit," Cornish explained. "By

the second general assembly, in 1975, the theme had narrowed to 'The Next 25 Years: Crisis and Opportunity.'"

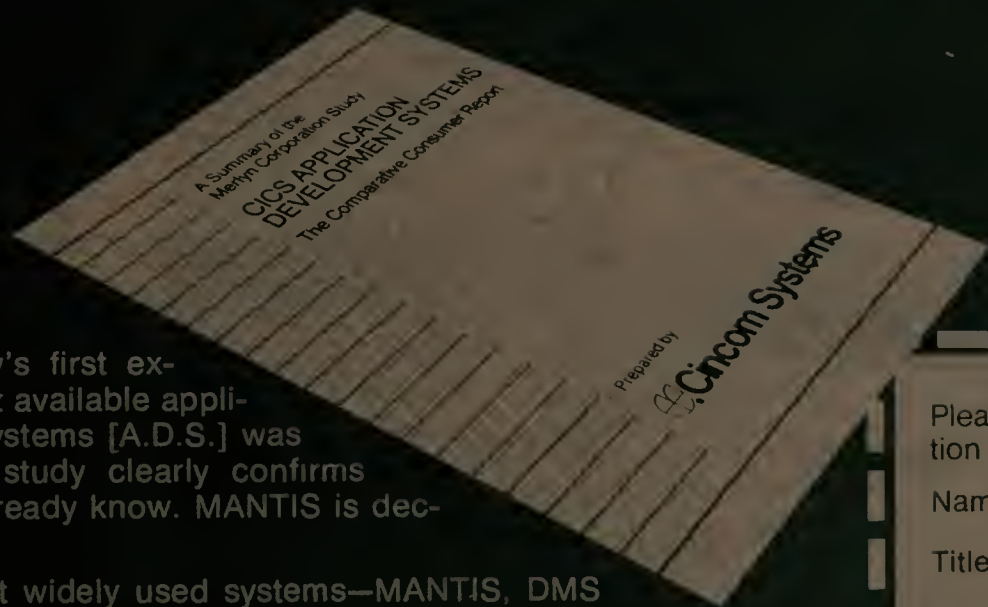
In 1980, the conference's scope shrank further to "Through the 80s." Last year, the conference dealt with only one specific aspect: communications. And next year, the theme will be "World View 84."

Cornish interprets this "drawing inward" as a conservative response to society's own worries and pressures.

"During the '60s, futurists were much more ready to speculate on what might happen 30 or 50 years into the future," he observed. "Now, society has a greater appreciation for how fast changes are occurring. There is also a sense that these changes are not necessarily going to be positive. So interest in forecasting has intensified, because of the increased need for forecasts."

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IN DEPTH

So, for the Yankee Group, one way to survive a volatile future is to study the environment, make recommendations and, often, step in and shape (or prevent changes in) its direction. Today, being right may require more than technology projection.

Getting People to Think

But, beyond such active involvement, the very act of studying a situation can alter it, according to Kirtland H. Olson, president of the

Harvard Group (a Harvard, Mass.-based technology consultancy). "In a sense, you can't ask intelligent questions of bright people without causing them to think. So you may very well leave perceptions behind that will affect the future," he explained.

"On the other hand, it can be amazingly difficult to get people to move in new directions, even if you express them precisely and directly. You see, in many cases, people are not going to know problems exist for

another five years. So this year, they might not be interested in listening to me predict future problems."

Perhaps Olson is one of the most rigorous practitioners of the projective arts. In addition to his Harvard Group work, he is also a senior consultant for Boston's Technology Consulting Group, Inc., publisher of two computer magazines (*Syntax* and *Syntax Quarterly*) and a technology-assessment/journalism instructor for both Boston University and North-

eastern University.

Most of Olson's assessments tackle material-processing or electronic-component technologies, for which he seeks to forecast markets and suggest future strategies.

He explained: "As a strategic planner, I'm usually presented with problems such as, 'We are in this business today. What will happen to it? What business should we be in tomorrow?'"

"In assessing a technology's future, I usually do not factor in the impacts of surprise developments — things that come out of left field, so to speak. What I consider are things that will happen within two or three years — things that are, or can be, known about now. They might not be known by my client. They may not be generally known. But they *can* be known by those who take the trouble to study the industry, to get around and find out what is going on and what people in the industry expect to happen."

Viewing Industry by 'Cells'

Olson first segments an industry into its component technologies, vendors, end users and applications. "Then the first basic step in characterizing the industry as it is now is to cross-correlate the segments to determine what are the applications by end user, technologies by vendor and so on. For each of these combinations, or 'cells,' one then determines its current size, growth rate and its forcing functions (such as the availability of semiconductor chips or the impact of governmental regulations)."

According to Olson, it is critical that all cells be small enough to be readily understood. "It is important that one segment the market until each cell is small enough so that one's judgment can function," he explained. In this way, even very large analyses can become tractable.

Then growth trends and forcing functions are allowed to act on all cells and to push them into the future. "Sometimes this causes the cells to split or to collapse. But, to evaluate the future of an industry, or any of its segments, all I need then do is add up all the surviving cells," Olson said.

Throughout the process, Olson demands that all trends, forcing functions and cell values satisfy his requirement for "simultaneous truth."

"For example, if a market is to reach a certain size, there must be enough skilled people in manufacturing. But there must not be too many people, or someone will go broke. Similarly with end users — every product will have to be made somewhere, sold somewhere and used somewhere." This simultaneous truth, when it occurs, is one measure of a believable projection. However, when simultaneous truth disappears, then either the original assumption are wrong or the projection has to be reexamined.

"The process is conceptually

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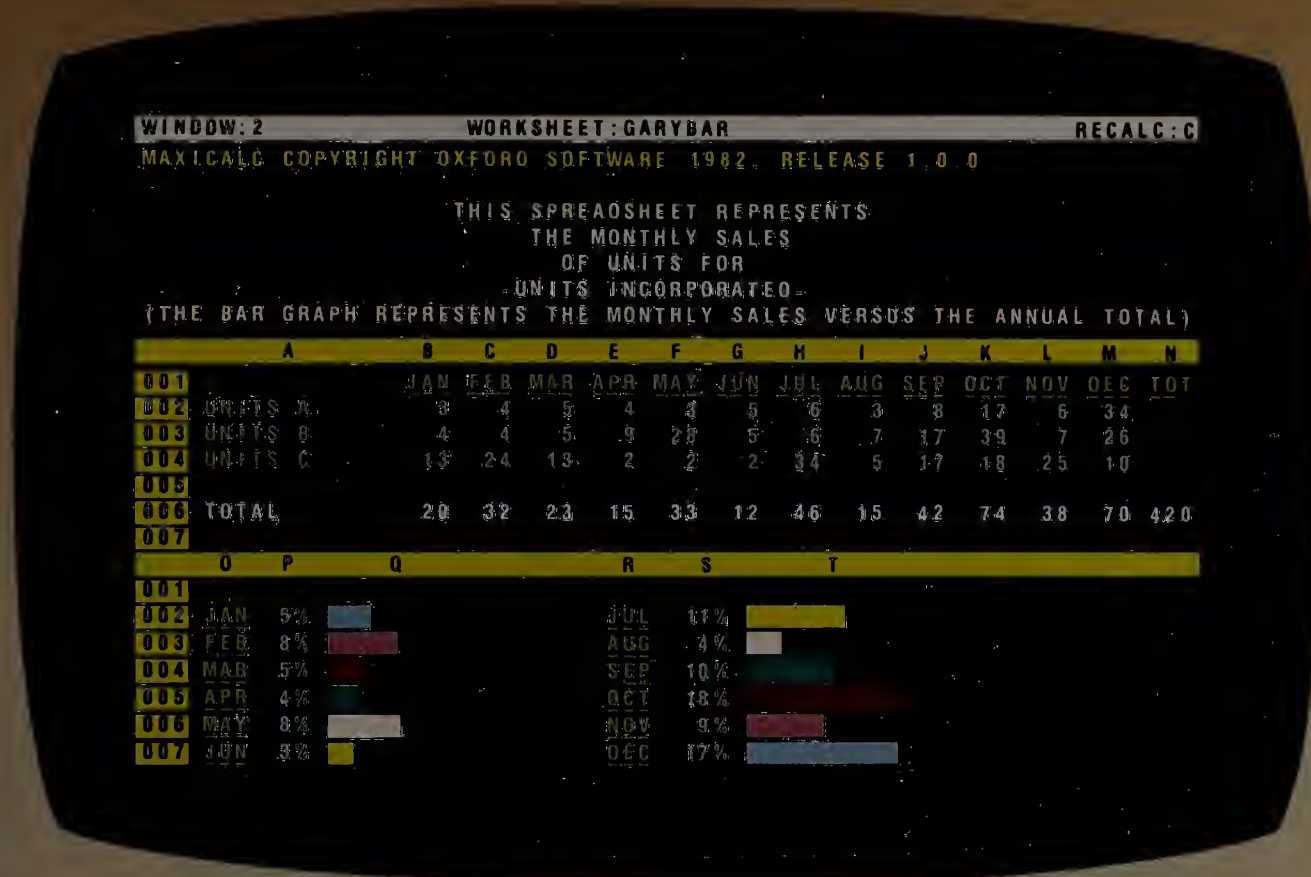
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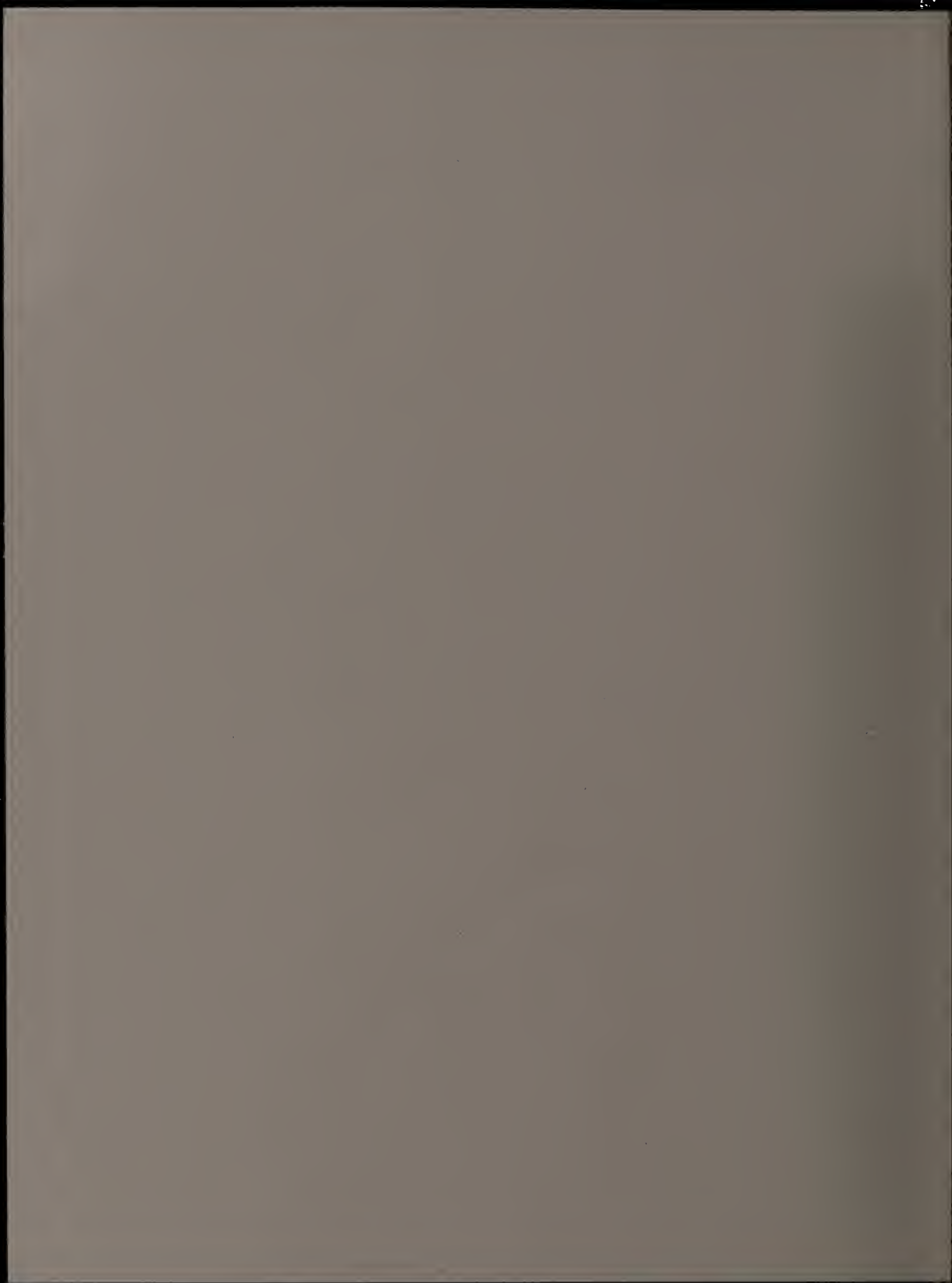
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IN DEPTH

ample," Olson explained. "If there is anything difficult about it, it is acquiring the specific information one needs or understanding the impacts of forcing functions."

To collect data, Olson talks with suppliers, users and people associated with forcing functions. "This way," he added, "one has the guidance of the best people in the industry — because one has talked with all of them."

Then he resolves conflicts, such as in published data, "which ranges all over the lot because of overreporting, underreporting, double-counting or just counting the wrong things."

These resolutions must, again, satisfy simultaneous truth.

But even with as much care as he exercises, Olson freely acknowledges that one can rarely, if ever, produce absolute truths. "The end result usually contains some imprecision. My rule of thumb is that 20% accuracy should be considered pinpoint precision on," he added.

Technology Assists

Most industry analysts are familiar with such techniques and apply them daily. And, of course, most data analysis is done on computers.

However, several analysts, including The Yankee Group, are taking high technology out of the statistician's chair and making it a full research partner.

The group has offices in the U.S., England, Australia and Japan. "Every office here is wired," said Howard Anderson. "Of course, we use advanced office automation and word processing systems," he explained. "But, more important, we can justify our own private, local communications network."

"We are extending this communications application through something called Yankee Net, which connects our clients electronically. We can't yet do large volumes of our work over Yankee Net. But not too long ago, we told our users about IBM's System/36, and five minutes after we transmitted the message, it was all around the world. We are still integrating that network. By next year, all of our clients will have Yankee Net terminals."

User Council

Paralleling the development of Yankee Net is another data collection program called the Yankee User Council. This has been a manual system, which is in the process of being automated.

Responsibility for the Yankee User Council falls to consultant Kate Carr. "The original idea behind the council was to survey a group of selected people on a continuing basis to ask them about their product perceptions, about important product features and purchase/decision criteria. We would measure these perceptions, then return to that same sample six months later to see if their

The end result of analysts' calculations usually contains some imprecision. One analyst's rule of thumb is that '20% accuracy should be considered pinpoint precision.'

perceptions changed at all.

"How the end user or purchase-decision maker perceives a product

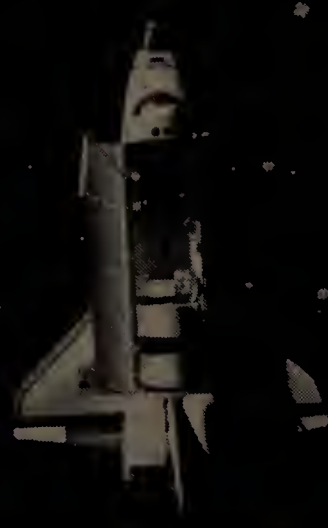
really has a lot to do with the product's success. If you perceive it as being able to meet your needs, then

you buy it to meet those needs whether it can, in fact, or not," Carr said.

Carr assembled this survey audience through telephone calls and letters to Fortune 500 companies and their large nonindustrial counterparts. Her contacts included DP directors, MIS directors and vice-presidents on up. Each potential council member received a detailed questionnaire on the hot topic of desktop

(Continued on In Depth/30)

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IN DEPTH

Analysts Discuss Technology Trends

Following is a sampling of analysts' predictions as to technological winners and losers over the next few years:

In the "thumbs-down" category, according to Datapro's Paul Nesdore, falls bubble memory. "When that first came out, I thought it wasn't going to last. Now I know I was right," he said. Also out, according to Nesdore, is touch-screen technology: "That technology is destined for the Smithsonian in five years," he predicted. "Now, if I see these touch screens installed in 60% of U.S. hospitals within the next few years, then I'm going to say I made a mistake."

But Nesdore climbs farthest out onto a narrow limb when he attacks one of today's sacred cows — so-called "user-friendly" systems. "Predicting is a no-lose business, unless you start attacking sacred cows, which I may be doing by attacking 'user-friendliness.' Everyone says they have it. I just don't find it, and I have 18 years' experience as a programmer/analyst."

Other technologies under Nesdore's glass include:

- The mouse: "I'm not sure the mouse isn't going to fall in that [loser] category. I'm reserving judgment. The mouse may have applications in CAD/CAM, but nowhere else."

- Decision support systems: "It's a worthless concept that will fade away. It's too soft — the technology too vague, carries too little information. It's a euphemism for a couple of software packages talking to each other and trying to seem like more than they are."

- Distributed processing: "I once said distributed processing as a concept would fade away. That's one where I was really wrong. Instead, it became more focused."

Future Computing's Portia Isaacson, who, according to her spokesman, doesn't consider herself a "futurist," offered the following predictions: "By 1988, at least half of the homes in the U.S. will have at least one home computer. By 1990, the best-selling book will be *Why*

Johnny Can't Program."

On a related topic, Isaacson admitted she may once have contributed to vendor misdirection with a chart she compiled on micro purchasing habits. Apparently the chart missed the dual reasons most people buy microcomputers: business and fun. "The chart ignored fun," she said.

Fundamental Changes

IDC's Tom Elliot joins a large group of experts predicting great changes from integrated artificial intelligence. "Whether you call it the 'fifth generation' or not, a fundamental change in processor architecture is going to come about — though I don't know exactly what it is," he explained. "We have capabilities — applications — such as artificial intelligence, that are straining the processing capabilities of today's computers."

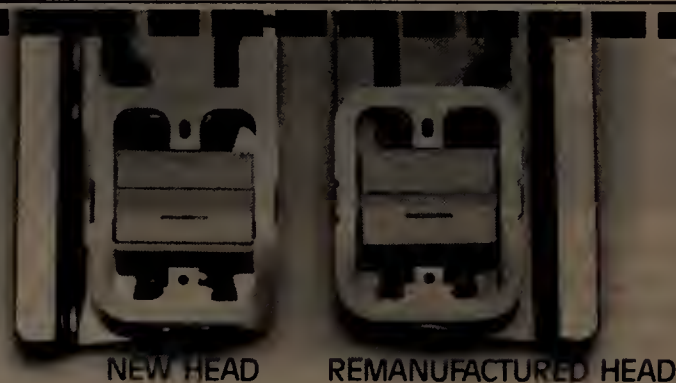
"And at the other end, there is a continued simplification of mass production of standard chips, which makes intelligence affordable in

practically anything. I was reading a press release from General Electric about a home network they're promoting. It seems that network will require intelligent blenders. Now, I don't know what an intelligent blender might do. But, if you have a \$10 chip, hey, it might happen."

Wendell Jones of Arthur D. Little has more general opinions about the DP industry's future. "I no longer believe a 'better mousetrap' is leverageable within the industry. For example, if one develops a spreadsheet that runs 20% faster, so what? Also, if one wants to build a dynamite 8-bit microcomputer based on the 6502, I wouldn't recommend that."

"One of the things I continually preach is that our industry is becoming increasingly formalized, more and more like other industries," he continued.

"We've already seen a transition from a technology-driven to a marketing-driven industry. So, what we'll see next will be more of a cost orientation, rather than the pure rev-



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Hot Issues: AI, Data Base, Communications

enue orientation we have now." According to The Yankee Group's Howard Anderson, the DP industry should pursue two current technologies with gusto: artificial intelligence and relational data bases. "I've been saying for five years that word processing is the silliest part of office automation," he explained. "To me, office automation absolutely begs for artificial intelligence.

"I suggest a scenario where, in the future, my personal computer/telephone — one device — will have a button marked 'Travel.' I will push that button and a voice will say, 'Where would you like to go, Howard?' I'll say 'San Francisco.' It will ask, 'When would you like to go?' I'll say 'Tuesday' or 'May 22' or 'Tomorrow,' and it will recognize all of them. And then, the machine will be smart enough to know that the last three times I went to the coast, I took the first direct morning flight and flew first-class, aisle, nonsmoking. So the machine asks, 'First-class, aisle, nonsmoking?,' and I say, 'Yes.'

"Now, that helps me. It doesn't get in the way of my work flow," he added.

"And all of this is going to evolve out of relational data bases," he continued. "We at The Yankee Group have been screaming about that for three years.

"One of the things we did back in 1978 was to come up with the concept of the advanced workstation. This was to be a device built around an individual. The device tied together communications, memory, processing power and artificial intelligence. The bugaboo at the time was, 'Where are we going to get all the programmers to do it?' And, our answer then, as now, is that the individual will become his own programmer, although he may never know it.

"Now, that's a very early definition of what people are now calling the 'expert system.'"

Communications Battleground

Anderson feels that communications technology is both important for the future and currently misunderstood. Today, communications is perceived as peripheral to the computer itself, he claims. "But that's dead wrong. The whole world is a communications bus — a very thick pipe out there. And off of that pipe hang some very interesting peripherals, such as the [IBM] 3081. It is worth a giggle to think about a mainframe computer as a peripheral, but in the communications world, it is."

Anderson argues that the coming integrated systems digital network (ISDN) will inspire a change in businesses' attitudes toward communications. "For example, large businesses

will build, and are building, their own private versions, which will become corporate assets."

Citibank is one example. "Citibank is building a system of super automatic teller machines — ATMs — that will communicate with a satellite at 9,600 bits per second. That means if I'm in Massachusetts and get a call for money from my kid at the University of Michigan, I can authorize \$100 for him to pick up at an ATM in Ann Arbor." The system should be running within a year at a beta test site, he added.

It may very well be on this battleground of communications that the banking industry will see its next great infighting, Anderson predicts. "If we are Citibank and we build this [private communications network], we can avoid the state banking regulations. We can become a national bank — and leave all the regional banks in the backwater. We will take a larger and larger percentage of business out of Massachusetts, Rhode Island, South Dakota and so on."

But such a program won't go unchallenged, he continued. "For example, look at Chemical Bank, which we think is going to emerge as a technology leader. Chemical Bank is saying, 'We're not as big as Citibank, but we can get other banks to join us.' It's almost a franchising plan, a consortium to build a fully loaded alternative to Citibank and Bank of America. Then Chemical Bank will come to Boston and say to Shawmut, 'Look, buy into this thing.' And Shawmut will listen."

Kirt Olson, with the Harvard Group and Technology Consulting Group, doesn't feel it is technologies, so much, that will shape the DP industry's and this country's future. Instead, our reactions to technology — and to technological threats, such as Japan's fifth-generation computers — may exert a stronger influence.

"You can see what will happen if you look at any other industry targeted by Japan or any other competitor. When a competitor says, 'I want to be ahead of you, and I am spending ev-

ery dime I can to get there,' you will always find that the long-term investor wins in the long term. There are no exceptions to that," Olson said.

"Now, how do we deal with [Japan's fifth-generation computer challenge]? Do we want to plan to compete with it head on? Or do we invest so that as these fifth-generation machines become available, they provide us with the components we need for the next systems. I mean, we may find the fifth-generation machines will prove to be just like Japanese resistors — extraordinarily useful.

"You see, there is no point in beating our heads against that particular wall," he continued. "There are lots of walls — lots of things to do. This is a country with 11 million people unemployed. We waste 88 million man-hours every day — and there are only 2,000 man-hours in a year.

"We lack neither a list of things to do nor the labor force to do them. But we certainly seem to lack the vision to see how."

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IN DEPTH

(Continued from In Depth/27) computers. A separate "executive survey" permitted busy managers to input their opinions quickly on desktop computer matters. "In return for executives' filling out these questionnaires and returning them to me, I included them in the Yankee User Council Industry Bulletin Boards, available through the Yankee Net electronic mail network," Carr said. With a password into these bulletin boards, council members have on-line access to posted returns from their own questionnaires. Through Yankee Net, the council members may also react or add to bulletin-board items. Carr can then edit these responses (often to remove identifying names) and repost them to the bulletin board.

Through this type of interaction, both the Yankee Group and its user council can keep up to date on events, important developments and changing opinions within their areas of mutual interest. "The type of response we get to this information is often like: 'That's unbelievable, Kate. This is fantastic. But in my company, we do such and such,'" Carr explained.

Carr is now building user council membership toward a goal of 2,000. As the network expands, the Yankee Group is finding additional ways to tap its potential.

One way is Pulse, an ongoing, in-depth study of one hot topic, with much data gathering taking place through the user council. Currently Pulse is monitoring the continuing saga of desktop computers.

Carr passes data collected through Pulse to any interested Yankee Group researcher. "What I've tried to do with the user council is to become an information catalyst," Carr explained. "When I get information, I point it to the correct research person. And if the researcher wants more information or has other important questions, I can contact a user council member and set up an interview."

Such uses of technology have already improved the Yankee Group's productivity, according to Anderson. "We did a major study on voice store-and-forward that would probably have taken twice as long if we hadn't used our network."

IDC is another market analysis organization that is

beginning to use high technology to study high technology.

However, IDC isn't jumping into electronic networks and polling just yet: "Of course, this is an option we

are looking at," explained Tom Elliot. "But we haven't become convinced that existing networks are at a point where one can get reasonably good statistical samples. Networks such as The Source

are obviously biased toward people and companies already on-line and probably are not representative of American business in general." (The reason, presumably, being that such users may be

more technically savvy, as a group, than today's average business people.)

Instead, IDC has developed two large data bases to support its researchers: Data File and Enterprise.

IN-HOUSE

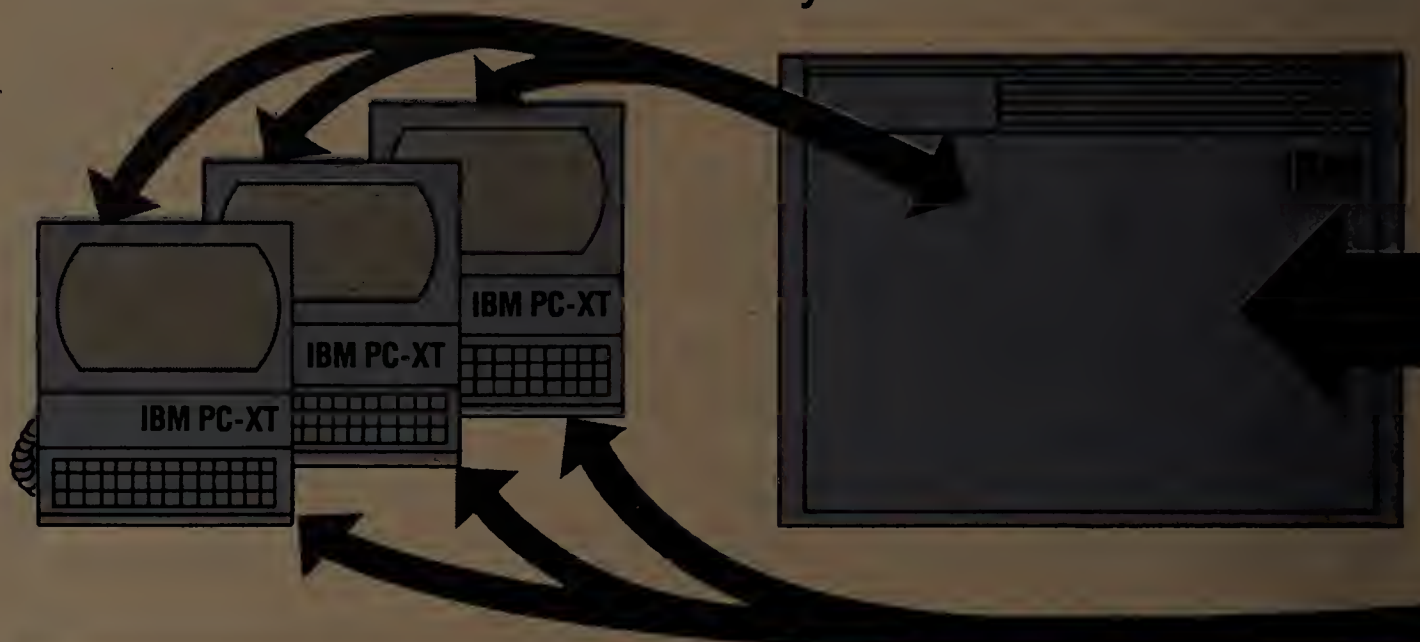
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Information Systems News,
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Data File contains descriptions of about 100,000 computer installations around the world.

Enterprise provides an on-line directory of electronic vendors, products and ser-

vices. Both of these help IDC get the information its customers require.

"We have Continuous Information Programs for both vendors and users," Elliot explained. "Both have fairly

distinct information requirements. Vendors typically want to know market segmentations, areas of fast growth, tech trends and key players. Vendors usually need this for developing

their own marketing plans.

"On the user side, IDC finds people more interested in using our services for strategic planning at managerial levels. Of course, there are also the product-specific

questions, such as, 'Does a this talk to a that.' We answer those, too, although IDC is not in the product-cataloging business."

The Harvard Group's Olson also uses technology, especially in the form of public data bases, in his work. He accesses on-line data bases generally for bibliographic and data searches.

Not on Faith Alone

Just as methods differ for probing the future, so do the resulting estimates. Consequently, futurists themselves caution their customers to apply common sense, original corroborative research and restraint.

"First, use common sense," advised the World Future Society's Ed Cornish. "Consult with more than one person. And do your own forecast. Also try to use separate predictions based on different methods — and pay special attention if different methods come up with the same result. It's good to put numbers in one's thinking and plans, but it's unwise to take numbers too seriously. Numbers are there to help define, objectify and sharpen thinking. But they are rarely as exact as one wishes them to be."

If a number's value is so critical to a business plan that very small changes affect the outcome and decision, then perhaps the plan is too risky or ill-defined. "If you need to know that something is between 89% and 90% to go into business, then the decision is made — don't go," Olson said.

Perhaps the best business plans are those that use forecasters' numbers to define strategic directions rather than project-specific goals.

Olson explained: "For example, if a number is big enough so that variations in it will not affect a business decision, then I'll go with that decision because I don't care about a number's value. Or, I will choose not to go ahead with that business decision because I am afraid."

"If a business person is using an analyst's information — incorporating it into a business plan — it is also very important to understand the assumptions behind the numbers," cautioned IDC's Elliot. "Understanding the assumptions that produce the forecasts is the only way to use the forecasts intelligently, to get a good feel for what the

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Projecting Best Image

Chuck Coates, Price Waterhouse & Co. partner heading its Small Business Department in Boston, sees futurists' data in business plans and applications for venture capital. Through his office, Coates helps clients set up business plans, evaluate existing or prospective plans or set up and audit accounting systems.

"As you know, there has been a flurry of start-ups in New England, and most of them have been high tech," he said. "Obviously, these companies use futurists' figures to project the best image for themselves. However, one often wonders how realistic the figures are."

Coates cited as an example a hypothetical start-up planning to supply microcomputer software. "If you use what futurists say about that microcomputer, you could come up with an astronomical projected revenue in a very short period. And if you went to a bank or venture capitalist with some outrageous projected revenue, they would probably wonder about the projection's realism."

Coates recommends that if analysts' predictions are critically important to a business plan, the numbers should be filtered in two ways. First is to factor in best-case/worst-case estimates of the figures' accuracy. "It is helpful to anyone reviewing financial projections if the projections say: 'Here is what happens if

our estimates follow what the analysts project, and *here* is what happens if what the futurists say is only 50% achievable.' I've always encouraged my clients to go through such what-if scenarios.

Then you get a real feel for the bottom-line effects of variations in assumptions."

His second conservative step is to factor in a range of assumed market share. "For example, the futurists say

there will be X millions of some product sold over the next five years. What I ask is that a company give me its best- and worst-case financial estimates, based on the fraction of that market it ex-

pects to sell to. Then you can develop a range of what your revenues might be five years out."

Arthur D. Little's Jones seconds the motion. "I think people have to go into the

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IN DEPTH

analysts' numbers and, depending on what one is trying to do, analyze the segment of those numbers that is pertinent."

Most futurists, however, don't break down their re-

sults into the kind of detail their consumers often need. "I think this, too, is because of the quick growth of the DP industry," Jones said. "To track it, you have to keep lots of numbers on-line and up-

date them very frequently — often weekly." To do so and still track individual market segments would just be too complex an undertaking.

"So, because we don't have the level of baseline

data that some other industries have, the individual analyst's most valuable role may be to look at existing data and formulate opinions. And that's where the experience of growing up with an

industry becomes valuable," Jones said. "I'm continually amazed that people think the DP industry is different from any other. In fact, there are similarities, such as the movement from technology-driven to marketing-driven. Most industries have followed that pattern. The DP industry is just earlier in its evolution.

"In addition, we're not just one industry. We have some very interesting dynamics," he observed. "Just look at what drives the hardware manufacturer vs. the software manufacturer, the software publisher or the retailer. They are all different types of business, industries maturing differently."

Jones emphasized that his clients break down and interpret analysts' projections. "Then I have a procedure I usually recommend: Define your business, then analyze your industry, customers and competition. Finally, derive your strategic position, select business strategies, determine resource requirements and implement your business plan. Then monitor it and keep repeating the process. Many people complete a business plan, get venture capital with it and shelve it. But the industry changes day by day. So revise plans continuously. If you sit still, you'll get passed by."

The Yankee Group's Anderson noted that users can, and do, swing to another extreme. They become too cautious to progress and end up addressing future uncertainty by making no decision at all. "In a word, industry at large is too often gutless. You can be an early innovator and take some risks. If you succeed, you're five years ahead of your competitors. Or you can be a follower and try to follow rapidly. But there comes a time when you must test new territory. You can't be afraid to be wrong once in a while."

About the Author

David B. Powell is a consultant and writer whose company, Wordframe, is located in Brookline, Mass. During the past 17 years, Powell has been a programmer, systems analyst, instructor, journalist and public relations representative.

His work has appeared in a variety of publications including the Philadelphia Business Journal, Popular Computing, Engineer's Digest, Computer Decisions and Computer Technology Review.

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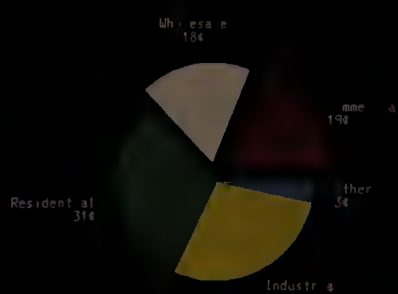
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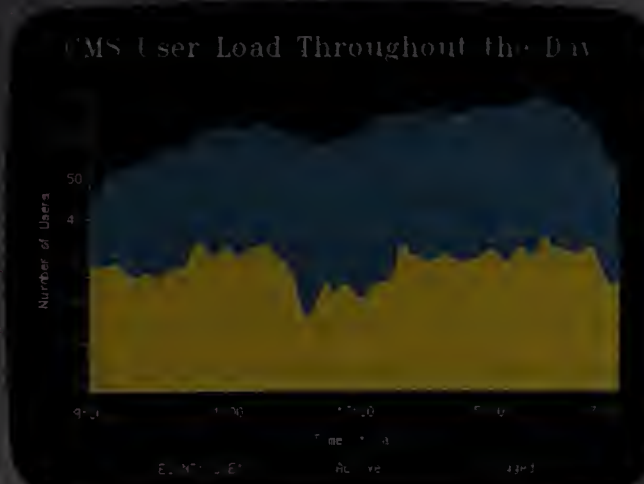
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By Bernard H. Boar

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The basic assumptions that make prototyping a "correct" strategy are as follows:

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- An inherent communication gap exists between project participants.
- Users require an active system model.
- A rigorous approach is correct once requirements are known.
- Extensive iteration is necessary.

inevitable, desirable and to be encouraged.

Assumption: All requirements cannot be prespecified. People find it extremely difficult to specify anything in detail. Users are very good at stating the goals, objectives and general directions they wish to move in, but are often unclear and undecided on exactly how they would like those things accomplished. Building a system is a gradual and continuing learning experience for all participants. How can one be asked to sign off on his final need when only 20% of the experience is concluded?

Data processing is one of the few disciplines that by deliberate policy does not deliver models. Physical models are seen as constraining on the designers and "hardware-dependent." This may be true, but so what? People test-drive cars, walk through model houses and even test personal computer software before they buy it. Why not give the consumer the data flow diagrams for the check-balancing software and let him decide from that?

People need help in determining

their needs. The best help, as all other industries know, is a real-world example. Examples can be studied and then critiqued in manageable units. Users cannot pre-specify needs in detail because they don't know them in detail.

Specification is extremely difficult work and runs contrary to the normal life experience of most participants. The process is itself insidious. The fulfillment of each set of needs spawns a new set. It is self-defeating to force incomplete ideas to be given the aura of detailed and final requirements.

Assumption: Quick-build tools are available. Only recently has this been true. Prototyping of large applications would not have been possible just two years ago. Today, the necessary software technology is coming into the marketplace that permits applications to be quickly modeled and, even more important, quickly changed.

If the life cycle could be compressed into the definition stage and managed with malleable software, the "cost-to-correct" curve would no longer dictate our efforts.

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use in prototyping are based on a few basic components:

- Integrated data dictionary that serves as a single repository for defining and controlling all system entities.
- Flexible data base management system that provides for both ease of design to permit straightforward data modeling and ease of access to facilitate program development.
- Nonprocedural, free-form, parameter-driven and high-default re-

port writer that is thoroughly integrated with the dictionary.

- Nonprocedural query language that permits ad hoc and saved queries; also thoroughly integrated with the dictionary.
- Interactive screen generator facility for painting IBM 3270-type screens and performing automatic input editing such as numeric checks, table lookups and so on.
- High-function/high-default procedural language for developing

applications.

- Automated documentation. Since the dictionary serves as a record management system for the application, a dictionary report function is able to self-document the application.

- Prototyper workbench. The tools are made available to the prototyper via an interactive workstation providing ease of use and fully interactive development and results feedback.

This technology exists in various forms of development today. If "tin-ker-toy" prototypes can be built quickly, a good guess can be tested. If terribly wrong, it can be thrown away without incurring a large penalty. If the model is in the right direction, it can be refined. Visions, concepts and needs can all be tested in the "prototype laboratory" for correctness before a large commitment of resources is made.

Software technology is changing rapidly. We must not view our current options in terms of software that is 10 years old, but in terms of what is available today. Software coming into existence provides a high degree of speed and flexibility.

Assumption: A communication gap exists between project participants. Communication is recognized as the fundamental problem of development. Even when people know what they want, it somehow comes out different in the translation. English is a poor specification language. Though certainly better, the prespecification tools lack the precision of any engineering specification language.

On the other hand, a user/prototyper discussion based on an operational set of screen dialogs is a very boolean experience. Discussion can take place in a simple question-and-answer manner:

Prototyper: "The customer number is six positions long, right-justified, numeric and must have a '3' in the fourth position — okay?"

User: "No, the '3' must be in the fifth position, and I don't like the way you abbreviated customer number (CUS-NBR) on the screen. Could you make it CUST-NBR?"

Prototyper: "After you enter all the fields, hit the ENTER key. If any field is in error, it will be highlighted in bright intensity and the message 'Highlighted fields are invalid' will appear on the bottom of the screen. Let me demonstrate."

User: "This is unacceptable. My people will never understand computerese. In the message, you must tell me the name of the field and exactly what is wrong."

Likewise, all the project participants can massage the prototype in a boolean manner to test it from their unique perspectives. Prototyping provides the best possible response to poor communication: a vivid and animated example.

Since logical specifications cannot provide such examples and users have had trouble understanding the graphical diagramming techniques, a recent trend has been to suggest that users learn how to make and read the diagrams (that is, to buy a house, you must be able to read the architect's drawing).

This idea as a response to poor communication is at best controversial. The user already has a demanding skill and profession. He has a critical day-to-day business function to perform. Does the comptroller



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really want or expect his line managers to be drawing flow diagrams or to be analyzing receivables?

Even if the users are willing, it must be recognized that flow diagrams are superficially easy to learn, but upon examination extremely complicated. This situation should not be surprising since these diagrams attempt to model highly complicated networks of processes and data.

To model a business environment,

'The solution to the communication gap is not to try to make everyone a professional specifier, but to let everyone receive specifications in a familiar medium. Working prototypes are a commonsense means for accomplishing that.'

the following entities should be defined:

- External interface — a source or

receiver of system data flow outside the boundary of the system.

- Element — A basic unit of data.

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- Data flow — A collection of data elements in motion.

- Process — A set of transformation logic that is applied to data flows.

- File — A storage medium for data flows at rest.

- Key — A collection of elements that define how a file is accessed.

These entities have multiple and complicated relationships with each other. For example:

- A process receives data flows from external sources.

- A process sends data flows to external sources.

- A process sends data flows to another process.

- A process receives data flows from another process.

- A process reads data flows from a file with a key.

- A process updates data flows to a file with a key.

- A process may be a subprocess of another process.

- A process can be decomposed into multiple subprocesses.

- All the above happen at a given level of decomposition.

- A level of decomposition must be balanced. All the outputs must be derivable from the inputs. All the inputs and outputs must be derivable from a higher level.

When viewed this way, the prospect of teaching users this definition technique is not all that attractive.

To understand the requirements proposal, both the forest (the large system) and the trees (data flow diagrams) need to be understood. Perspective must be rapidly interchangeable to get a balanced understanding.

A menu-driven prototype provides a familiar way to provide both tree and forest perspectives. As one descends the menu hierarchy, one descends into more and more detail. The consequences of having performed a detailed function can be understood by executing the effected function.

The solution to the communication gap is not to try to make everyone a professional specifier, but to let everyone receive specifications in a familiar medium.

Working prototypes are a commonsense means for accomplishing that.

Assumption: An active/participatory system model is required.

Words, still pictures and graphs are certainly good means of communication. However, they simply cannot effectively communicate motion. When the subject has living attributes, we need to see it animated to understand all the meanings and implications.

Interactive systems require animated specifications. Users need to play with the system. It is quite different to look at hand-drawn screens and pretend that there is motion and quite another to hit the enter key and watch the system happen before you. The difference is in orders of



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magnitude. There is no reason to settle for a passive specification if a dynamic one is possible.

All parties will understand the implications of the proposal much better if it is animated. If a picture is worth a thousand words, an animated model is worth a thousand pictures.

Assumption: A rigorous approach is correct once requirements are known.

The endorsement of prototyping is not a license to abandon structured

and disciplined building techniques where and when they are correct. For each part of the life cycle, a pragmatic assessment must be made to determine the best approach for that step. Most structured disciplines recommend the use of inspections, a heuristic approach, to find errors in top-down-structured programs.

Heuristic approaches, like prototyping, work well in the early phases of development to help turn sand into cement. Rigorous concepts like

span of control, coupling and cohesion work well in the design and programming phases. One must be free to exercise professional judgment to select the best technique for each problem.

Assumption: Extensive iteration is inevitable, necessary and to be encouraged.

Users should be aggressively encouraged to change their mind. Improved insight should evolve from experience. Brainstorming about how to change a model when it sits

before you is an exciting experience. People need a friendly environment, receptive to change, to maximize their potential contribution. Rigorous definition implicitly suppresses change after the definition stage, since change implies poor analysis. You lock yourself into a far less than possible solution.

By encouraging iteration and experimentation through prototyping, you will deliver two-year-old systems on cutover day.

Iteration is absolutely needed to develop ultimate needs. It permits a good fit early between the user and system. Though you can certainly iterate within prespecification models, the iteration is constrained by the absence of animation.

Not surprisingly, these assumptions lead to a different conclusion and overt strategy than prespecification. If you accept the prototyping assumptions as an accurate assessment of reality, then you will minimize life-cycle cost, implementation time and project risk by using a heuristic definition approach such as prototyping. When definition is finished, all participants can have a high level of confidence that the product will be acceptable at conversion since they all experienced and refined it during definition.

Comparing Assumptions

The decision to choose a prespecification or prototyping approach is not one of comparing them directly but of assessing the validity of the supporting assumptions.

As a group, the assumptions that support "rigor" are highly suspect. We know from our experience that:

- Users have trouble prespecifying all their needs.
- Communication is always a problem.
- A passive model leaves too much to the imagination.

As a group, the assumptions

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which support prototyping appeal to both experience and intuition. Practical experience indicates that they are often true.

Most engineering disciplines routinely use prototyping to control risk and verify an idea before making major resource commitments. Prototyping eliminates the inherent project communication problems by permitting all debate to focus on physical anchors.

Effect on Productivity

Though there are literally hundreds of solutions offered to improve life-cycle productivity, there really are only four primary alternatives:

- Off-load work to software vendors.
- Off-load work to end users.
- For your developers, trade labor for intelligent software.
- Work more intelligently.

Off-load work to vendors. The goal of this approach is to acquire finished applications from a commercial software vendor. Since many applications have well-defined and common functionality and interface points, the vendor should be able to deliver a solution at much less cost than attempting to develop the application internally from scratch.

Though this approach can certainly help, as a major pillar of a productivity strategy it will probably be unsuccessful because of the following:

- Vendor-provided software will only make up a small percent of your application portfolio.
- Much of the application portfolio is composed of industry/product-dependent software and customized intelligent software is a business edge.
- You are an "exception"-driven business. Most of your logic is "if-then-else." Though the vendor may provide you with a shell, all the hard work remains.

Currently, vendor-provided software is being quite successful in helping the spread of personal computers by providing information center and decision support functions. As personal computers become nodes in larger applications, they too will require application-specific solutions.

Off-loading work to software vendors will help, but

if you are a medium-size to large company, probably not much for your production center applications.

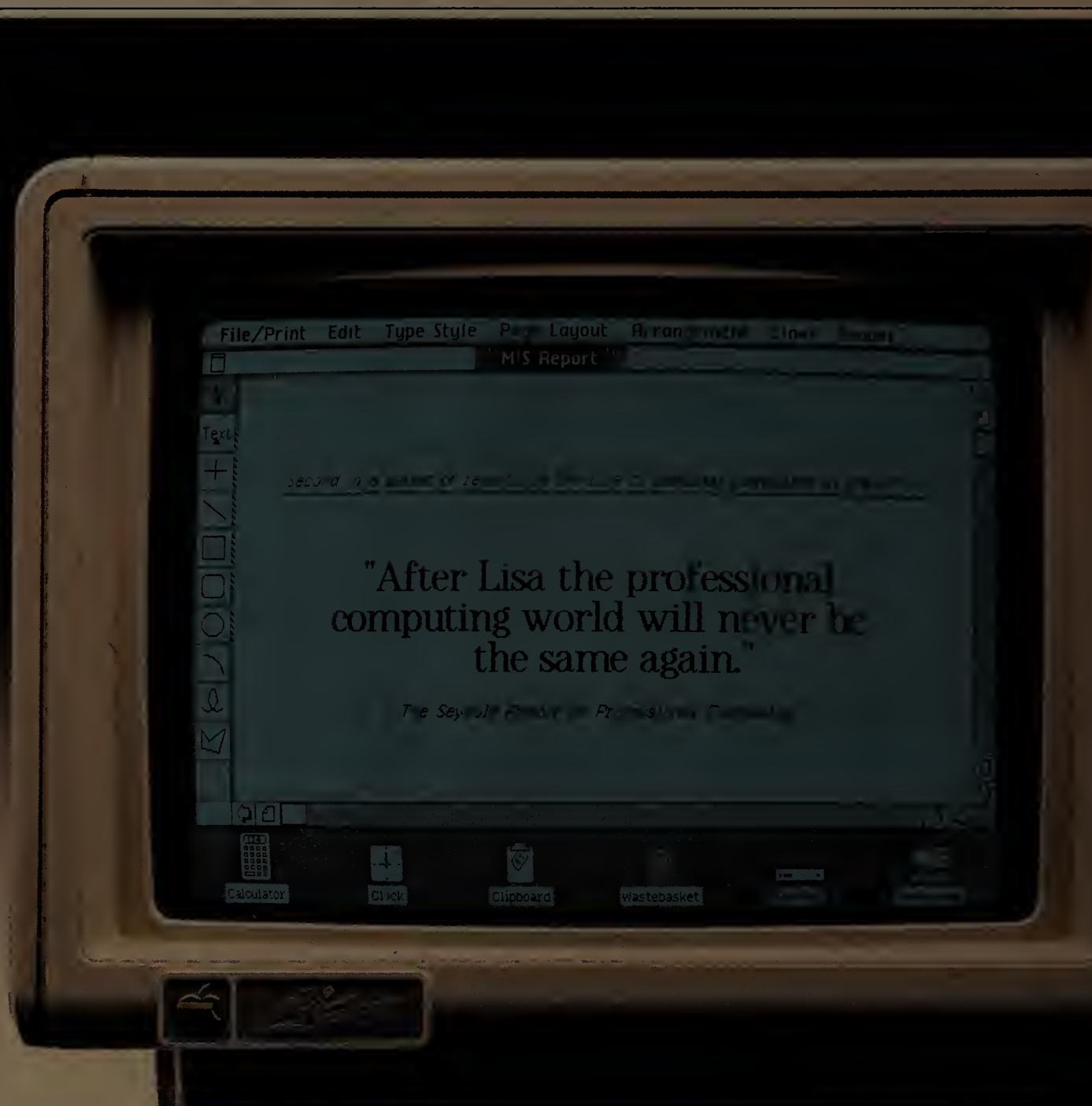
Off-load work to users. The goal of this approach is to make everybody a pro-

grammer, just as dial telephones made everyone an operator. Though this option will certainly address the backlog of applications that are oriented toward the information center, decision

support or personal data base, it will not really help in building systems of any complexity.

There must be a clear distinction made between the types of applications end us-

ers will build and those that will still have to be built by professionals for the foreseeable future. As users attempt to move beyond retrieval and analysis applications, they will not be exempt from



Apple's new Lisa™ is the world's most powerful personal computer.

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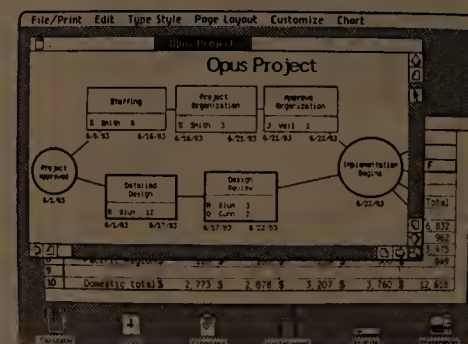
On the contrary.

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Lisa's revolutionary software lets users perform several applications simultaneously, even "cut" and "paste" them together. The powerful project management program seen here is a Lisa exclusive.

approach to software and 200 person-years of development.

Lisa replaces complex computer commands with symbols

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Even someone who's never touched a computer before can learn Lisa in under half an hour. Versus the 20 hours or more required to unriddle conventional PCs.

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But people don't just learn faster on Lisa, they also work faster. Each of Lisa's powerful applications* use symbols and commands common to all. So with little practice, users can move from LisaCalc to Lisa-Graph to LisaWrite without missing a beat. Or use them all at once, "cutting" information from one program and "pasting" it directly into another.

the same complexity and problems the professional developers have had to address for years.

Off-loading work to users will certainly help with the reporting and analysis types

of applications.

Trade developer labor for more intelligent software.

The goal of this approach is to adapt more intelligent and functional software as development tools. Since the cost

of executing instructions continues to decline while the cost of labor rises, it is cost-effective to let automated software functions do as much work as possible and let the developer only have

to develop the custom and exception procedure aspects of the application. This approach can pay extremely high productivity dividends.

It is not unreasonable to expect increases in developer

productivity of 300% to 500% by using advanced software technology. However, regardless of that technology, it is necessary to build a user-acceptable system.

Work more intelligently.

As always, the key to making a major productivity improvement is to change horses. Any technology or technique as it goes through refinement will deliver smaller and smaller incremental gains. To achieve orders-of-magnitude increases, you must jump to a new solution space.

Many of the best ideas for improving productivity such as component engineering and data administration all fall into this category. Prototyping, likewise, is a "work smarter" solution. Perhaps eventually, artificial intelligent software will ask all the necessary questions and automatically deliver a solution. In the meantime, working smarter must equate with improving communication, and prototyping does that extremely well.

Prototyping is part of the continuing trend in data processing to more friendlier and intimate solutions. Just as programming languages have progressed from cryptic machine language to high-level program generators and the computer has moved from the distant batch machine room to the desktop, requirements definition is evolving toward prototyping. The prior definition techniques were only temporary steps until animated definition by prototyping was technologically possible.

The building of application models is a no-lose situation. At best, following a few quick iterations, a consensus is reached and the actual development can commence with a high probability of success. At worse, the prototype makes visible all the issues requiring resolution before the construction of the actual system can begin.

The development of requirements is an imperfect process carried out by imperfect people. It is both an expensive and high-risk endeavor. Prototyping dramatically reduces the exposure to failure. There is little more one can expect from a definition technique.

About the Author

Bernard Boar is an information systems consultant for AT&T in New Brunswick, N.J.†

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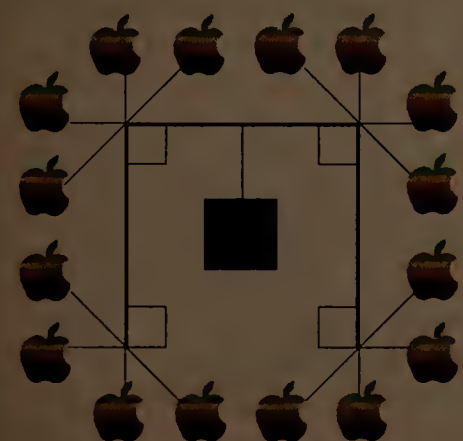
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WHAT'S IN A (DATA ITEM)

By Douglas and Lenore Meng

Identifying, naming and establishing ownership of data items would not be so difficult if organizations had better methods for keeping track of what they do.

We all know the value of the data resource and understand what data resource management means. In practice, we are overwhelmed by the enormity and complexity of these ideas. Perhaps, in truth, many firms have attempted to do too much all at once.

Regardless of debates about top-down or bottom-up approaches in general, in data resource management we recognize that inevitably we must deal with the enormous number of facts or values at the bottom.

The process of identifying correctly the data items, which give meaning to sets of facts at the initial level of abstraction, is either the first step toward coherency or the last; in either case, it must be done.

While the job of identifying data items may seem to be endless, the number of basic data items is, in reality, large but finite and relatively constant. Possible derivations from these basic facts are infinite and ever-changing. So, while a strategy for identifying, naming and establishing ownership must be developed to include all data items eventually, we advocate devoting the majority of the initial effort to those items that appear to be primitive or basic.

In the "best of all possible worlds," the systematic and studied naming of things, from primitive data items all the way "up" to integrated data bases and systems, could be a kind of logic

that glues the whole system structure together.

At the base of the mass of data and information are the atoms — the basic facts and values of a system. Sets of these basic facts make up the simplest molecules of the system; they are the primitive or basic data items. Many definitions have been proffered to describe what a data item is. We add that a data item is "a name given to a set of facts which can be used interchangeably in a (business) process according to (business) policy." An operant word in this definition is "interchangeably," and each fact or value must be tested to see if it is appropriate for each case in which the data item is to be used in a process.

The procedure involved in identifying data items is similar to looking for clues to solve a mystery. The majority are obvious, and with a little training and practice, people with nontechnical experience can ferret them out. They are the raw material that people put in and use. It is the appropriate grouping of facts and the subsequent naming of them that gives coherency to the numbers and words on forms, reports and screens and connects the right facts with their contextual meaning — the data item name.

There are patterns to fact sets. Some have a discrete range of values, and the forms we analyze often display these as a menu to be checked. Others, and these are often numbers, have a bounded range with allowable values within lower and upper limits. These become edit criteria for maintaining accuracy within systems. Some value sets are continuous, and organi-

zational policy dictates methods for determining which facts to include or exclude. The investigation of the patterns of fact sets is a driving force of structured analysis methods, the products of which comprise the inputs to the data resource administration function.

There are always a few miscellaneous facts with no sets to belong to which require the attention of experienced analysts with access to the user community. We have found that ambiguity related to data items usually reflects a lack of clarity in business policy, an issue which needs to be confronted and resolved.

While data items come in several flavors, it is usually not too difficult to distinguish between plain vanilla (the basic data item) and chocolate (the derived or potentially derived data item).

Personnel without technical training can understand that derived data items are hybrids of basic data developed through manipulation of an algorithm and are often more than capable of documenting the algorithm as a basic program specification. These are the compounds in our systems which are dependent on the existence of the more basic molecules. Derived data items may not be as obvious to spot when the issue is one of reformatting, but a few examples can help with identifying most of these as well.

Of course, data items that seem to be basic in one system are found actually to be derived in another, and the final designation of basic or derived status would not be determined until all systems had been examined and

IN DEPTH

logically integrated. The process of naming will, in actuality, never be finished, because organizations are constantly in the process of change.

The most stable data is

base or primitive data, however, and once good names have been established, they will have to be changed less frequently, even though updates to the value sets will always be required. It is proba-

bly not wise to debate too much about categorization in the early stages. If a data item is believed to be potentially derived outside the domain, the project timetable or other practical considerations

should determine how much backtracking is desirable.

Establishing Ownership

Perhaps it is by virtue of our talent for naming and the limits placed on our ex-

pression of that talent that we fight so vigorously over the words we use in the work place. As computer usage evolved from the manipulation of numbers to the use of another form of symbols — words — DP became another participant in the debate over terminology. Words as symbols have always posed more challenges to our understanding and communication of meaning than numbers.

To avoid controversy, or in admission of defeat, our systems have been designed to accept multiple words with the same meaning — the AKA, or “also known as” situation. Aside from the obvious problems of redundancy and possibility for error, we have to come to terms (the pun is definitely intended) with the increased difficulty of systems integration that ambiguous use of language presents.

Our suggestion is that from the array of possible words, a “preferred term” should be carefully constructed, supported and encouraged for all automated systems including word processing. Even though the users may kick and scream, they will be more satisfied with their systems in the long run. Since our technology by its inherent nature fosters a more precise environment, those who manage the technology are the natural leaders of the thrust for integrity to optimize the effective use of hardware and software resources.

We propose that establishing “ownership” can help to resolve difficulties that arise with conflicts in terminology. The owner of a basic data item is the individual in the organization with the right to make a change in the fact set of a data item or who can decide which values to include and which to exclude.

In a company which manufactures bicycles, we would be likely to find a data item named BICYCLE-PAINT-COLOR, with a discrete fact set of blue, red and green. Our job would be to locate the person in the organization with the authority to add the color yellow to the fact set or to change the value range to blue, red and yellow. That individual, or rather the job title that individual carries, “owns” the data item and has the right to name it — within the framework of a naming



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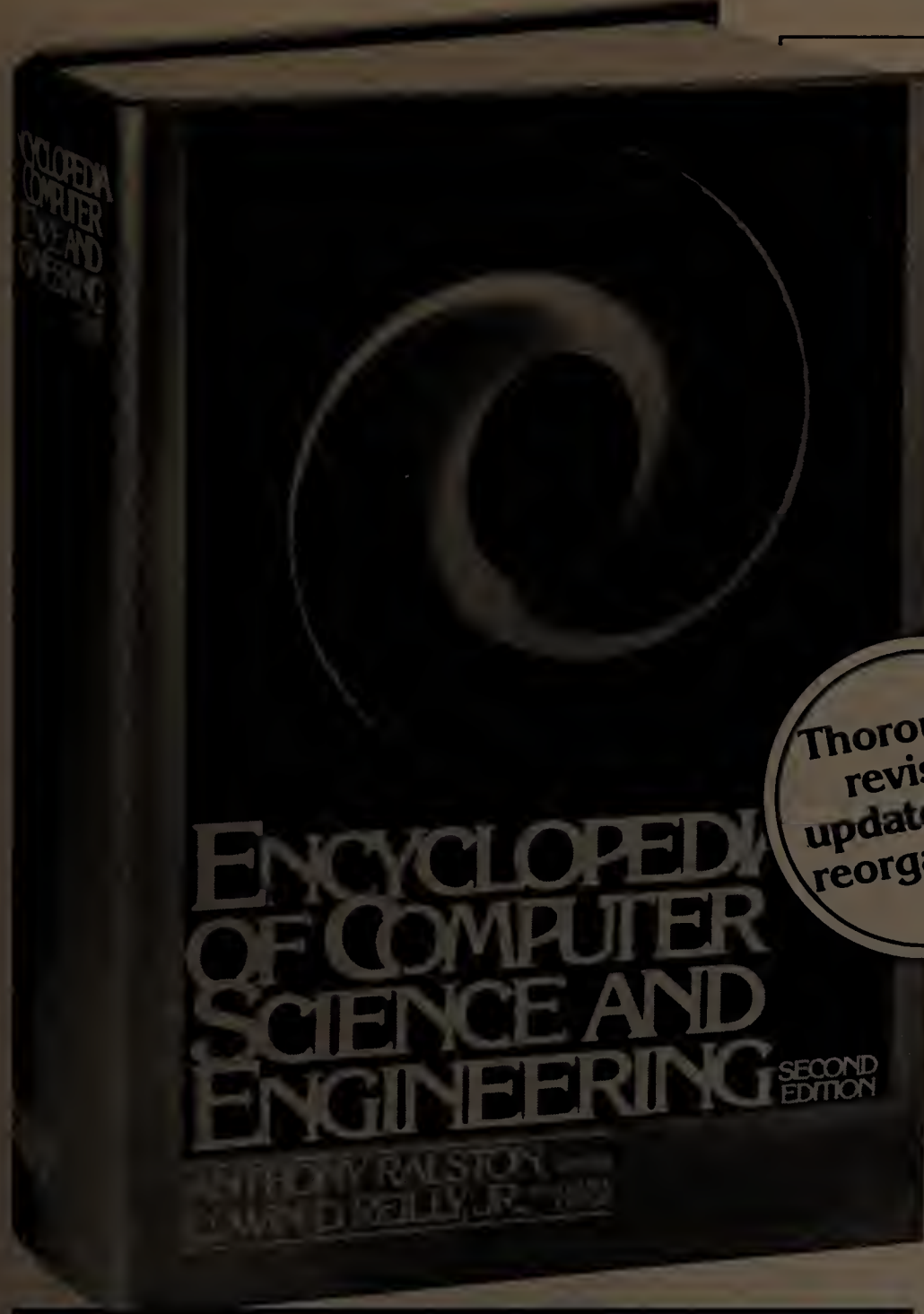
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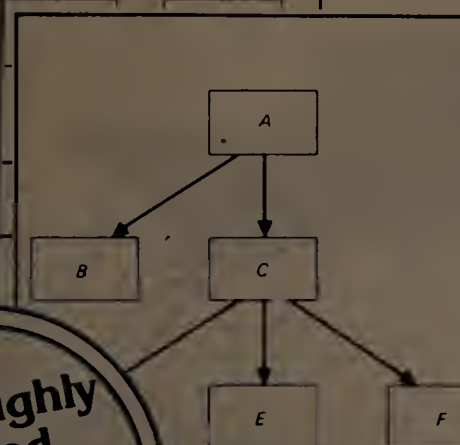
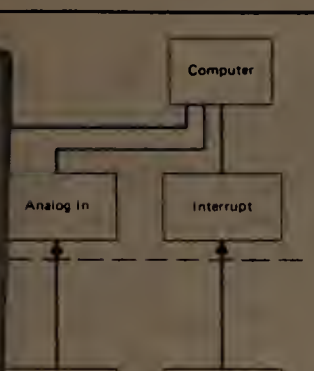
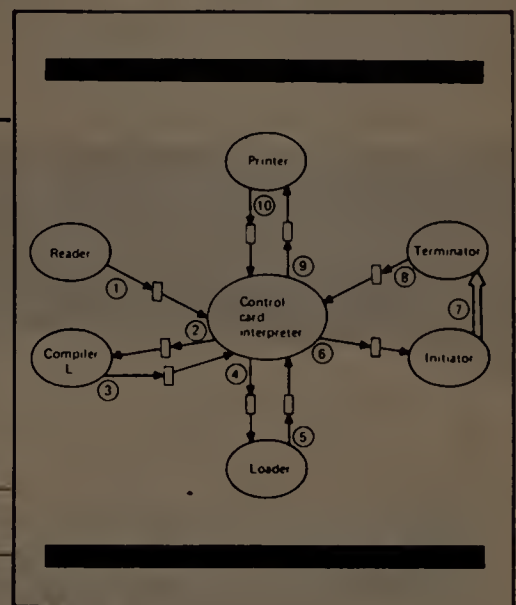


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standard, of course, which we will discuss below.

When we are considering a data item with a bounded range, we look for the individual who sets that range or approves deviations from it.

For continuous ranges, such as CUSTOMER-NAME, the owner would be the job title which establishes the policy for determining whether a customer is included in the list or not.

When the data item is derived, the owner would be the person or job title who could change the algorithm for deriving the resulting fact. For example, the controller may "own" the algo-

rithm for the calculation of BEFORE TAX EARNINGS.

Sometimes we may find that the true owner, particularly of derived data items, is outside the boundaries of the organization. The Internal

Revenue Service would be a good example. In this case, we would want to designate as the data item owner the person within our organization who monitors any changes in those requirements. In a sense, this person would be the data item owner's internal representative.

It would be naive to suggest that job descriptions are so complete and precise that employees know just how much authority is theirs to exercise, although things would be a lot clearer if they did. Still, by asking the right questions, we can come a lot closer to resolving ownership issues. If no "owner" can be found in the lower ranks, data items belong to department heads, vice-presidents or to the chief executive officer by default. After all, if changes have to be made, the data resource administrator needs to know who is empowered to authorize them and who to notify when the change has been effected.

It would be equally naive to believe that all conflicts over ownership that might result can be traced to power struggles between employees. The analyst often assumes that there is a single data item when there are several with several owners. The individual who manages long-range product planning may "own" bicycle paint colors for products in the planning stage, while the person who orders the paint doesn't deal with colors at all, but Munsel numbers, which specify the exact shade to be purchased.

The concept of ownership applies to files, programs, data bases and systems, and the same basic philosophy applies. The naming of a file is the province of the position(s) that own the data item or items designated as keys or identifiers to the file. Integrated data bases are named by the position title that "owns" the majority of the files and so on.

If DPeres resent the prospect of giving up the control that may heretofore have been exercised in naming user data, remember that the development of standards for naming things is clearly within the data processing bailiwick because of constraints in hardware and software. The facts within the data processing environment belong to us, and the identification and naming of the data items that we use

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ourselves is a task that could occupy us for some time to come.

Naming Things

We learned as children that it is difficult to look up a word in the dictionary if we don't know how to spell it. It is equally as difficult to access information using an automated dictionary product or word processing tool if we don't know the name of what we're looking for. We can get a lot closer if we know what an item is likely to be called through searching key words in a specific fashion.

The naming convention that we will discuss recognizes the underlying logical relationships between components of a system and utilizes that logic as its framework. We don't insist that you accept our logic but suggest that in developing or modifying your own conventions, you give some thought to the logic that applies to your operation and adopt standards that reflect the logic.

Our discussion of naming begins with the most fundamental and complex component — the basic data item. The convention we propose involves the concatenation of several key terms in a specific order. Be aware here that we are dealing with logical names, not the physical names, such as Cobol name, which are also required.

We prefer to think of the physical name as the "alias" of the preferred name, by the way, thus making a distinction between this concept and the AKA discussed earlier. Much time can be spent trying to find and document all AKAs, but we believe that this effort is discretionary, whereas the documentation of alias physical names is an important component.

We might mention here that a common step in data analysis, the definition of data items, is often eliminated or reduced if things are well named in the first place. If you will take a shot at "defining" a well-named data item, you will discover that you are likely to have a self-referencing definition. A good test of "well-namedness" is to check for self-referencing definitions as you evaluate your standards.

Following are the major divisions we have found useful in naming basic data items: system name, data base name, logical file name, generic name. According to your needs, you may want to add or eliminate fields. You may wish to postpone structuring of complete names until more knowledge is gained.

Naming the Basic Data Item

- The Basic Data Item — Generic Name.

The last name (we call it the generic name) in our concatenated convention is perhaps the easiest to bestow and should be the most rigorously controlled, both logically and physically.

A list of acceptable generic names should be widely circulated. No new

'A common step in data analysis, the definition of data items, is often eliminated or reduced if things are well named in the first place. If you take a shot at "defining" a well-named data item, you will discover that you are likely to have a self-referencing definition.'

generic names should be accepted without rigorous investigation. Some examples that come to mind

are: name, address, amount-\$, date and weight-lbs.

Regardless of the type of business,

we suspect that the generic list would be short enough to allow for precise definition and documentation of AKAs. We even advocate that a generic name should be physically formatted in the same way each time it appears logically in a file or program, although we realize that implementation of this standard takes some time in actuality.

The benefits of this approach are that generic business elements can be more easily integrated, converted,



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compared, adapted and accessed on a dictionary through key word search.

• The Basic Data Item — Logical File Name.

There is a fundamental logical bias under which we operate. We believe that, in general, basic data items cluster around concepts and therefore "belong" to files — the kind of files likely to be integrated into data bases eventually, if not now.

In general, we believe that derived data items and data items with a single value "belong" to programs, even though they may be stored in stand-alone files. The logical file name (you might prefer the term "object name," or "entity name") thus becomes part of the moniker we attach to the basic data item.

The actual process of logically assigning data items to files and then testing that assignment (normalization) is an essential ingredient of logical data base design. In a data base environment, some clear set of procedural rules must be used to assign data items to files logically, even though the physical location may be different.

This logical file name assists in differentiating what might appear to be the same data items in one file from those in another. EMPLOYEE-BIRTH-DATE would be found in the EMPLOYEE file, for example, while CLIENT-BIRTH-DATE would be located in the CLIENT file.

There is a distinct but subtle difference between basic data items that identify concepts, called either "identifiers" or "keys," and the facts used to describe those concepts, often referred to as "attributes." The fact set of a basic data item as file identifier is often continuous, that is, it has no limitation on the number of values in the set.

Ownership may be difficult to determine. Someone within the organization must define the concept. That person would be both the concept (logical file) owner and the owner of the data item used as the identifier of the concept. In the example of a general concept, CUSTOMER, we are likely to find that the vice-president of marketing defines the concept as "all organizations and/or persons contacted, sold to or known." He would thus be the owner of the concept MARKETING CUSTOMER and its identifying data item MARKETING-CUSTOMER-NAME.

If we also had a manager of warranty sales who defined customer as "all organizations and/or persons sold products over the last six months," we have a different concept and a different owner. The manager of warranty sales would own the concept WARRANTY-CUSTOMER and own the identifying data item WARRANTY-CUSTOMER-NAME.

Data items that identify concepts or logical files are additionally problematic because they often occur in more than one concept. Dealing with natural reoccurrence of these key data items is the basis and backbone

"There is a distinct but subtle difference between basic data items that identify concepts, called either "identifiers" or "keys," and the facts used to describe those concepts, often referred to as "attributes." "

of relational data base design. For example, CUSTOMER-NAME is also a data item in the concepts ORDER

and CONTRACT, as well as several others.

As with all rules in our naming

convention, there are exceptions. The naming of identifying data items is an important exception.

We suggest that key data items retain the name of their primary concept even though their relationship to other concepts is necessary and critical as secondary identifiers or "foreign keys." So the CUSTOMER-NAME which occurs in ORDER would not be named ORDER-CUSTOMER-NAME but simply CUSTOMER-NAME to indicate its status



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IN DEPTH

as primary identifier to the CUSTOMER file.

- The Basic Data Item — Data Base and System Names.

The data item's first name(s) is the name of the

system or data base in which it resides. The assignment of this name is important to consider at the time of systems integration, conversion or when data is shared by multiple user groups. As

more data becomes accessible across internal organizational boundaries, a subset of basic items will eventually be identified as belonging to the organization as a whole, while for security or other

practical considerations, some systems and data bases are restricted to organizational subunits.

It is useful to consider here that many data items will have common generic

and logical file names since organizational units tend to overlay each other or mirror each other with only the intervening variable of time and function.

The marketing, design, engineering and manufacturing data bases probably would contain files and data items about customers and parts, though examination would reveal important variations in value ranges and, of course, different ownership.

The system and data base names would differentiate between the data items, but a change in data item values in one system or data base should trigger an investigation of data items with the same last names in other systems and data bases.

The same general philosophy of concatenation applies for derived data items, but the names of the fields are somewhat different. We stress here that derived data items are much more likely to change and their multiple use is probably more limited than basic data. For these reasons, we allow for more flexibility in naming them.

The above discussion about generic names and system names applies for the derived data item. The major difference is the substitution of a program name (or report name) and an algorithm name.

Most methodologies for structured program analysis suggest that processes be given "action-object" names, and we would carry these names here. The "object" name would match, if possible, the logical file name used for basic data items.

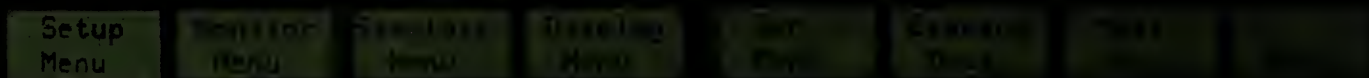
We believe, in addition, that with some control over the naming of the actions performed, patterns would soon be recognized that would enable the use of programs in multiple applications with little or no modification.

Abbreviation Conventions

Because of the number of key words or names which our convention concatenates, the complete preferred name of a data item can get to be quite long, necessitating some type of abbreviation convention. The method we will suggest is simple to learn. The names become recognizable to users after brief exposure to them in reviews or walk-throughs. The rules are as follows:

1. All abbreviations are to be expressed in no more than

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Perhaps it's time you took control of your datacomm problems. The minute one of your datacomm interfaces crashes, you're faced with more than inconvenience. A bill for service calls, as you play "vendor roulette" trying to locate the problem, can run into thousands of dollars. If you're faced with a down network, it can cost a hundred times that.

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Communications debugging and troubleshooting are done quickly and easily either on-line or in a post-processing mode. The 63 triggers, the most extensive in the industry, enable you to trap real time so you can catch elusive problems. The intelligent 128K-character capture memory saves you time by eliminating idles without sacrificing timing information. And you've just increased your real data storage!

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- four letters.
2. Abbreviations are made by dropping the vowels from right to left (report becomes RPRT, source becomes SORC, program becomes PRGR).
3. If a term would be less than four characters after dropping the vowels, then the vowels are reinserted from left to right.
4. Dashes are inserted in case a complete term has fewer than four characters.
5. If two or more terms could be used in naming, the term with the fewer letters should be supported as the preferred term. (We use the term data "item" in preference to data "element" for this reason.)
6. Complete data item names are concatenated abbreviations, for example, MrktOrdItemNumb, PrchOrdPantNumbGlln.
7. Exceptions to the rules of abbreviation are published in a list of Standard Abbreviations (AKA, IRS, DOD and so on).

Some Thoughts About Codes

Up to this point, we have blissfully ignored the issue of codes. We don't have to explain to DPers why codes were so necessary in the old days when storage was proportionally so much more costly than it is today, but we do have to confront the problems that coding structures cause for us today as we analyze data items.

Codes are the most insidious form of redundancy in our systems because they duplicate, sometimes in multiple occurrences, the value ranges for data items we are attempting to name and document.

In some instances, we have found as many as 50 different codes for a single basic fact set. At first we treated codes as we would have dealt with any AKA term, but we began to recognize some subtle differences and began to refer to codes as "synonyms" — a means of representing meaning of a fact or value set for a data item, but in a different representational mode. In our method of naming, we would thus have both EMPLOYEE-SEX and EMPLOYEE-SEX-CODE, with "code" being an added generic name.

To compound the problem, we have found that many codes contain multiple meanings, such as a combined race, sex and marital status code, which stand for three different basic data items with "natural values," that is, values expressed in words. Some coding structures have if-then logic embedded within them, so that a character in one field of the code influences the interpretation of other fields.

Our sympathies go out to analysts trying to break these codes and unbundle from them. The best advice we can offer is that, whenever possible, we should work toward the standard that a code should represent no more than one data item with a natural value.

Albert Einstein advised that things should be viewed in the simplest way possible but should not be seen as simpler than they really are.

The activities of identifying, naming and establishing ownership may seem to be simple because they are basic and repetitive, but the process of understanding the meaning and use of data at the item level requires sophistication.

The implementation of standards and guidelines for their use, developed by experts, can enable nonexperts to perform many analysis or documentation activities with a minimum of training.

Naming conventions will evolve more because of our growth in understanding of data than because our organizations will change, and the establishment of data ownership will serve to clarify the user-DP relationship as much as it will describe the responsibilities of job positions in the business.

About the Authors

Douglas and Lenore Meng are partners in Trianco, a "cottage industry" based in Hartsburg, Mo. They specialize in the design of training programs for system designers, planners and users.

Among their clients are the Westinghouse Corp., Simpson-Sears of Canada, Pennsylvania Blue Shield and the U.S. Navy. Their programs are marketed through Brandon Systems Institute, Bethesda, Md.

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THURSDAY, OCTOBER 6, 1983

FRIDAY, OCTOBER 7, 1983

7:45 - 8:45 a.m.

EYE OPENER:

The Personal Computer in Communications
Dr. Larry Magid, Executive Vice President, Know How, Inc.

9:00 - 10:00 a.m.

KEYNOTE:

The Micro/PC Industry: IBM Domination & Future Directions

Adam Osborne, Chairman of the Board, Osborne Computer

10:00 - 11:00 a.m.

The Executive/Professional Workstation

John Crudele, Sr. Manager, Management Information Consulting, Arthur Andersen & Co.

Software for Engineering Users

Aki Runchal, President, Analytic and Computational Research, Inc.

Channels of Distribution for

Microcomputers

Jim Finke, President, Internetwork, Inc.

2:00 - 3:00 p.m.

Spreadsheet Applications

Laurence Press, President, Small Systems Group

The Micro-Mainframe Connection

Dick Andersen, Director, AM/MS, Charles Bornheim, Principal, AM/MS

Packaging & Documenting Software

Howard Zack, Marketing Communications Manager, VisiCorp

3:10 - 4:10 p.m.

The Future of Business Graphics

Dr. Irwin Jarrett, Chairman and CEO, Fingraph Corp.

The Engineering/Technical Workstation

Glenn Stewart, Industry Marketing Manager, WICAT Systems

The Personal Computer After Market

4:20 - 5:30 p.m.

Micros and the Changing Role of MIS

Dr. Michael Hammer, President, Hammer & Co., Inc.

7:45 - 8:45 a.m.

EYE OPENER:

Information Utilities for Personal Computing

KEYNOTE:

9:00 - 10:00 a.m.

The Fifth Generation Workstation & Artificial

Pamela McCorduck, co-author, "The Fifth Generation: Artificial Intelligence and Japan's Computer Challenge"

10:00 - 11:00 a.m.

Word Processing for Micros: The Next Step

John Murphy, Vice President, Advanced Office Concepts Corp.

Networking Microcomputers in the

Corporate Environment

Arnold M. Roberts, Consultant, ADC Associates

Delivering Good Training and Support to the Corporate User

Karen Orton, Vice President, National Training Systems

2:00 - 3:00 p.m.

The Information Resource Center

Tom Kosnik, Researcher, Stanford Business School

Portable Computers for Professionals

Doug Mosher, Division Manager, Sybex, Inc.

How to Raise Venture Capital

Moderator: Melody Johnson, Securities Analyst, Cable, Howse & Ragen

Panelists: Tom Cable, Partner, Cable, Howse & Cozadd

3:10 - 4:10 p.m.

Integrated Software Solutions

Fred Gibbons, President, Software Publishing

DBMS on Microcomputers

Scott Kuklin, Executive Vice President, Helix Corp.

Selling to the Corporate Account: Problems & Pitfalls

William H. Luden, President, ComputerEase

4:20 - 5:30 p.m.

The Role of Microcomputers in Business

Panelists: Richard L. Willmarth, Manager, Office Systems, Storage Technology Corporation (user presentation).

Four "In Depth" Tutorials

Wednesday, OCTOBER 5 from 9:00 a.m. - 5:30 p.m.

EMCE's "In Depth" Tutorials are all day seminars for managers who need a comprehensive understanding of one of the topics outlined below. All tutorials include two coffee breaks and a complete course notebook with reference materials. The tutorials will be held at the R.M.S. Queen Mary, Long Beach, CA.

How to Select a Business/Personal Computer (T1)

• How to Select the Features You Need • Determining What Size Computer You Really Need • What to Look For — and Look Out For — In Your Hardware and Software • How to Determine What To Spend • How to Select The Right Software Package For You • How to Simply Define Your Computer System Requirements • How to Minimize Costly Professional Help • How to Select the Best System and Suppliers

Course Instructor: Arnold M. Roberts, president of ADC Associates brings to the tutorial extensive experience in seminar leadership having presented tutorials to managers across the country in the areas of data base management, networking and other application specific areas.

Microcomputers and Local Networks (T2)

• Overview of Networking and Definitions • Hardware Issues • Interconnection Technologies • Microcomputers and Components • Software Issues including Operating Systems • Centralization vs. Decentralization • Equipment and Systems: A look at Network Models • Technology Trends and Future Directions

Course Instructor: J. Scott Haugdahl is a systems specialist at Architecture Technology Corporation, Minneapolis, Minnesota, a consulting firm specializing in computer architecture, including local networks and office systems.

UNIX Tutorial for Managers (T3)

• The History of UNIX • UNIX — The Product • Dynamics of the UNIX Marketplace • Overview of Available UNIX Products • Comparison of Hardware Systems • A look at Application Software • The Capabilities and Limitations of UNIX

Course Instructor: Jean Yates, president and associate of Yates Ventures specializing in researching UNIX systems, applications and the growing UNIX marketplace. Yates Ventures has been involved in extensive laboratory testing of UNIX related products and has been credited with producing 5 books on the subject.

Business Graphics for Managers (T4)

• Assessing Your Hardware Requirements Including Printers, Plotters and CRT's • Assessing Your Software Requirements Including Operating Systems and Interfaces • Evaluating Current Business Graphics Software • Developing and Using Business Graphics Software • Producing Pie and Bar Charts • Understanding Program Compatibility • Creating Presentations with Graphic "Slide Shows"

Course Instructor: James Morrison, independent consultant and educator, has trained many people in the area of microcomputers. As a contributing editor to LIST software publication and newsletter, and an evaluation expert for the FIRST SOFTWARE, Mr. Morrison is a true professional in his field.

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Thursday, October 6 and Friday, October 7.

An intensive two-day session for the busy executive or professional who needs to learn the basics of using a personal computer in the least possible amount of time. You'll learn how to use the IBM PC and have concrete experience with Lotus' 1-2-3 integrated software package.

The workshop will be given in conjunction with National Training Systems (NTS), a leader in providing microcomputer training products and services to large corporations.

The Executive Microcomputer Workshop will be held at the Long Beach Convention Center. Register Early! Enrollment is limited.

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☐ Microcomputers and Local Networks (T2)
☐ UNIX Tutorial for Managers (T3)
☐ Business Graphics for Managers (T4)
(In Depth tutorials will be held at the R.M.S. Queen Mary, Long Beach, California)
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When Selecting Packaged Solutions Define Your Productivity Problem

By Roy Bildson
Special to CW†

Since the beginning of the computer era, the topic of programmer productivity has been the hottest issue among the many serious concerns of those close to the industry.

Opinions range from those who still maintain that the first step taken beyond machine languages has destroyed any chance for true programmer productivity, to those who feel that programmers are really unnecessary — that one need only speak an English-based command language into a synthetic electronic ear and let hardware and macros do the rest.

The output from this process, as the theory goes, will reproduce the users' desires within an acceptable level of error. With due respect to each of these groups, the answers must lie somewhere in between.

To seek improvement in programmer productivity, it should first be defined. Programmer productivity is not something that can be measured in lines of code per day or programs per month. If we think about efficiency applied to a computer system, we have to talk about quality and timeli-

ness, in addition to quantity.

To be productive, a computer programmer must produce a quality product in a prescribed amount of calendar time. A programmer's ability to do this and increase his output at the same time is the best definition of programmer productivity. In short, the delivery of computer programs on time and in accord-

with the users' requirements is critical to any definition of programmer productivity.

Programmer productivity aids can be classified into three broad categories. Techniques (such as structured programming); scheduling packages (to control program development cycles); and actual software packages (such as program gen-

erators or debugging aids).

Although the discussion below will confine itself to software packages, it is clear that significant productivity improvements are possible through strict adherence to the rigorous disciplines of structured programming and critical path scheduling.

(Continued on Page 104)

Security System Unveiled for 'Natural'

RESTON, Va. — The Natural Security System, a product providing centralized control of the Natural information processing system, has been introduced by Software AG of North America, Inc.

The package operates in any environment that supports the Natural processing system, which currently includes IBM's DOS/VSE, OS/VSI, MVS and VM/370-CMS operating systems, according to the vendor.

System administrators can define to the security system detailed profiles of users, applications and files, accord-

ing to Software AG. This reportedly allows centralized control of the fourth-generation information processing environment from initial program development to production application system execution in batch and on-line.

Typical User Profile

According to Software AG, a typical user profile might include details of the applications that the user can access, the language statements allowed in the user's programs and the system commands the user can execute.

An application profile might include specific time periods when the application can be executed, the initial transaction that is invoked when a user logs on to the application and details of users who are allowed to access the application.

The package reportedly includes a mailbox feature providing communications between application systems and their users.

Purchase price for the security system package is \$15,000 from Software AG, which is located at 11800 Sunrise Valley Drive, Reston, Va. 22091.

Chicago Police See 'UFO' As Solution to Deadline

CHICAGO — The Chicago Police Department's data processing staff was handed a formidable assignment when the city council passed a gun registration ordinance and gave it only three months to implement a computerized system.

The department was able to meet the deadline with the help of User Files On-line (UFO) from Oxford Software Corp.

"We had to work quickly to

have the system ready when the ordinance went into effect," said Robert Miller, manager of systems and programming. "The project was further complicated by the fact that the city's fingerprint identification system, running on a leased minicomputer, also had to be rewritten at the same time."

The burden was increased by the fact that the minicomputer

(Continued on Page 102)



The Chicago Police Department's gun registration system was created in record time with the help of a productivity tool.

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System Helps Police Handle Gun Registration

(Continued from Page 101)

lease expired at the same time as the implementation date of the gun registration system.

"We didn't have the time or staff to do the project in [IBM's] CICS," Miller said. He added that the department shares an IBM 3081 in the city's data center. The department has 25 on-line systems running a wide variety of applications.

"The 3081 was well filled, and we found we needed a small processor to handle the gun registration and fingerprint identification systems," Miller continued. "We decided on an IBM 4331 running the SSX operating system. UFO's compatibility was a significant factor in our decision to use this operating system."

That created the additional problem of installing a computer and expanding the computer room while developing the new applications. To meet the deadline, the programmers used UFO to develop the system under OS while the computer room was being readied. When time came for testing, they took the program off OS and put it on DOS. "It moved instantaneously," said Dennis Tonetti, project manager.

"UFO enabled us to start doing the programming even though the detailed design was not completed," Miller said. "We finished the programming, testing and conversion in

the three months allocated."

The gun registration procedure involves a search to be sure that the applicant has no criminal record, Miller said. The system includes information on everyone arrested since December 1976. When an application is received, the department performs a search.

Miller explained that the system has to compensate for someone who might lie about a criminal record. The system has to perform searches that involve all possible factors, he said.

The system includes 1.5 million records spread across 6 IBM Vsam files with many alternate indexes. The system requires 28 supporting on-line programs to accomplish the

required searches, Miller noted.

The new fingerprint program has dramatically reduced the time required for a search, he said. "With the dedicated minicomputer, some sophisticated fingerprint searches were taking 40 minutes," Miller stated. "With UFO we were able to design the system in such a way, working with the file design, that the time required now is only one or two minutes. Users love it."

Users of the fingerprint identification system include 20 police officers who do queries, 20 records technicians who search records, 66 fingerprint technicians who search on-line fingerprint classifications and 7 remote terminal operators who primarily perform data entry.

"The key to our success was the ability to develop under OS, then go to the new operating system IBM had just developed, [SSX]," Miller said. "With UFO, the system development was completed ahead of schedule, and when the hardware came in, the system flipped right over. It would have taken at least four times as long to generate a system under traditional CICS programming."

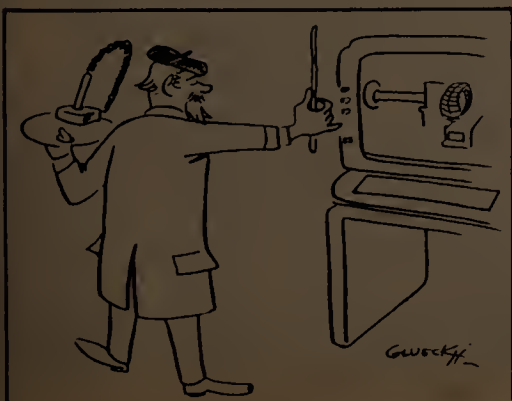
He explained that the department's backlog of applications that have to be developed quickly led to the installation of UFO. "Our users are interested in large on-line systems," Miller said. "However, if it takes us two years to put up the applications, that's not responsive enough."

Mortgage Tool For IBM CPUs Announced

DALLAS — Informatics General Corp. has announced its mortgage loan package for IBM mainframes. The package operates under IBM's DOS/VS, DOS/VSE, OS/VS1, OS/VS2 and MVS operating systems.

The enhanced Mortgage Loan System meets requirements for the Lombard rule of interest calculation, a spokesman said. The package records automatic billing of late charges due. In addition, the release adds amortization of service fees to the loan amortization schedule and gives users the option to print or not to print late charges on client bills, the vendor said.

Current users of the Mortgage Loan System who subscribe to the Informatics annual product support service will automatically receive the new release. The price of the package ranges from \$21,000 to \$47,900, depending on the amount of mortgage loans in an insurance investment portfolio. More information is available from the vendor's Commercial Information Systems Operation, 9441 LBJ Freeway, Dallas, Texas 75243.



Trying to read these hex dumps is like pulling a sword out of a stone.

Knights of the Dump Table

How many nights have you and your knights (or fair maidens) spent in a quest to uncover the cause of a program abend or cancel.

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COMPUWARE
SYSTEMS SOFTWARE THAT MAKES SENSE



Define Your Programmer Productivity Problem

(Continued from Page 101)

Do programmer productivity aids really work? Do they really increase programmer output?

Unfortunately, the answer is not very often. In fact, all software productivity packages should include a warning on the wrapper that reads: "Beware — The contents of this package may not increase programmer productivity." But why? Don't they all have something to offer?

Often the product fails through no inherent fault of its own. The product may fail for reasons other than the ones listed below, but these three reasons dominate:

- The product is not compatible with other techniques, packages or standards used by your organization.

- The product offers no real benefit. This is the case when the package is used to solve a problem that really didn't exist in the first place.

- No objective measure is set up by your organization to calculate the benefits of the product. Success, in this case, depends on opinion or a vote.

Failures caused by the first two reasons usually can be avoided by

Financial System Gets Version II For IBM Mapics

WARWICK, R.I. — Daly & Wolcott, Inc., a consulting firm, has released Version II of its accounts payable management system for IBM Mapics/DfasII running on IBM's System/34, System/36 and System/38 minicomputers.

Version II is said to combine the vendor profiles and open-payables screen with the existing payment-history screen, reportedly providing a method of accessing payable information and managing corporate cash flow. User comment lines have also been added to the screen, making it easier to keep track of vendor comments or miscellaneous notes.

The updated software automatically extracts and saves detailed history by vendor, allowing managers to analyze payment trends and highlight such things as average payment days for the last three invoices and high balance amount and date. It also displays standard terms, year-to-date purchases and date of first sale, a spokesman said.

Users can use the presented screens to scan through open payables and select certain invoices, he added.

Other reports include an aged-open-payables report utilizing an "as of" date, payment history listing and vendor comment listing. All reports can be printed for one vendor or for a range of vendors, the spokesman maintained.

Version I users can upgrade to the latest version for an additional \$100. For first-time users, the package is priced at \$500 for IBM's System/34, \$650 for the System/36 and a one-time \$900 fee for the System/38.

Additional information is available from Daly & Wolcott at 120 Lavan St., Warwick, R.I. 02888.

careful analysis of the product before it is installed. Failures caused by the third reason are a lot tougher to avoid.

Yet it is clear that to be economically justifiable, any software productivity aid must make some measurable improvement in time, effort or money.

Mechanism for Measurement

It is equally clear that if we are to measure the benefit, we must have some mechanism to take such a measurement.

If any organization fails to establish the criteria to measure, as well as the measurement device, then the best productivity package is likely to fail.

How many times have we all heard: "But the programmers don't like it"; "We took a survey, and nobody uses the package"; and "I haven't heard any feedback one way or the other."

Each of these well-intended measuring processes will doom almost any software product. To avoid this approach, a potential software buyer must:

- Define criteria that would justify purchase of the product. The criteria must include time, effort and money.

- Set up definitive measurement devices to measure the criteria (and know the actual measurement before installation of the product).

- Carefully apply the product to

the problem (take care of training and so forth).

- Collect the measurements and make the rational business decision of cost vs. benefit.

Although this approach may sound simplistic, it is often ignored during the trial evaluation of a potential software acquisition.

Even though there are no guarantees with a given product, the method of evaluation presented here guarantees the selection will be based on an objective review of factual information.

Who could ask for more?

Bildson is a district manager at Compuware Corp., located in Birmingham, Mich.



Data Dictionary Enhanced For System/38 Under CPF

OAK BROOK, Ill. — Michaels, Ross & Cole, Ltd. has announced Version 1.1 of its MRC-Dictionary, a data dictionary for IBM's System/38.

Designed to run under Release 5.0 of IBM's embedded Control Program Facility (CPF) operating system, MRC-Dictionary interacts with the MRC-Retriever, MRC-Reporter and MRC-Grapher components of the firm's MRC-Query program product, the vendor said.

Version 1.1 of MRC-Dictionary includes a data-dictionary build mechanism, a single-file build option, security features, synonym field capabilities and full-help key support. The package is self-document-

ing and takes a tutorial approach to System/38's existing data dictionary. This simplifies the data base administrator's job and allows nontechnical employees to access information, the vendor said.

When installed with other MRC-Query modules, MRC-Dictionary offers media-independent query capabilities to management or staff-level personnel.

The MRC-Dictionary package, as well as each of the other modules in the MRC-Query package, costs \$1,140 per module.

Michaels, Ross & Cole is located at Suite 501, 1302 W. 22nd St., Oak Brook, Ill. 60521.

'Skyport' Transfers Files

LOWELL, Mass. — Sky Computers, Inc. has announced Skyport, a program to transfer files between operating systems. The package was designed for users of Digital Equipment Corp.'s PDP-11 or LSI-11 processors.

With Skyport, users may transfer source and binary files among the following operating systems: DEC's RT-11; Unix (Versions 6 and 7); Whitesmith Corp.'s Idris; Digital Research, Inc.'s CP/M; and Intel Corp.'s ISIS-III. The package requires a PDP-11 or LSI-11 processor with the RT-11 operating system, 224K bytes of main memory and either two floppy disk drives or one hard disk and one floppy drive, the vendor said.

The package allows the user to perform three main functions. It re-

organizes various file formats and allows users to copy floppy files to DEC's disk format. Files can then be transferred to the target operating system format. The package can also be used to list all files in a directory and dump blocks, tracks or sectors to a list device, the vendor said.

The package costs \$500, Sky Computers said from Foot of John St., Lowell, Mass. 01852.

Business System Announced For System/36

CHICAGO — System Software Associates, Inc. has announced the Business Planning and Control System (BPCS), a series of manufacturing, financial and distribution programs for IBM's System/36.

BPCS can be used as a complete business software package or as individual modules. The manufacturing applications software contains modules for shop floor control, job and product costing, bill of materials processing and capacity testing. Financial application programs include general ledger, accounts payable and accounts receivable. The inventory and distribution packages include inventory management, order processing, billing and sales analysis and purchasing modules.

The on-line software costs from \$2,000 per module, the vendor said from Suite 2814, 222 S. Riverside Plaza, Chicago, Ill. 60606.

NCR V-8000 Receives Job Scheduling

MASON, Ohio — Ivan Software, Inc. has announced Ivan-Submit, an automatic job scheduling package for users of NCR Corp.'s V-8000 line of processors.

Designed for operation with NCR's VRX operating system, the package schedules and executes user-defined jobs with an infinite number of scheduling variations, a spokesman said.

The package reportedly will not reduce response time to interactive users because it operates according to user-defined predetermined priorities.

Ivan-Submit can reduce overall system operation costs by assuming some operator responsibilities, the vendor claimed. It also can reduce training time.

The package can track job execution and maintain a history of job completion dates and processing times, the vendor said.

Operator-initiated overrides are provided so that a job can be run outside its scheduled time and date. The Ivan-Submit package is written in Ansi/74 Cobol and requires a 10-minute installation process to customize the job control language, the vendor claimed.

Ivan-Submit costs \$1,595.

Ivan Software can be reached through P.O. Box 76, Mason, Ohio 45040.

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- PREDICT, the first data dictionary specifically designed for the fourth-generation application development environment.

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Meet Attendees to Be Offered \$1,000 Cut on Finance Tools

ANDOVER, Mass. — Software International Corp. will offer a \$1,000 discount on any of the company's financial-application products to attendees at its fall series of software seminars.

The seminars will be held in 48 cities in all regions of the U.S. and in five major Canadian cities between now and mid-November. Each seminar includes an introduction to the new Software International general ledger package, related financial-application packages and concurrent afternoon general discussions and sessions on specific products.

The \$1,000 discount is good for any Software International product

leased within 120 days of the seminar, the vendor said from One Tech Drive, Andover, Mass. 01810.

Spreadsheet Targets VAX-11s

BEVERLY HILLS, Calif. — Quality Software Products Co. has announced Q-Calc, an electronic spreadsheet program for the Digital Equipment Corp. VAX-11/750 and 11/780 under Release 4.1 of the University of California at Berkeley's Unix operating system or under Bell Laboratories' Unix (System III and System V) and DEC PDP-11/70s under System III.

Features include push/pop access

CENTEREACH, N.Y. — Axios Products, Inc. has announced Version 5.0 of its Remote On-line Print

to the shell; ability to read data from files or pipes into the spreadsheet; ability to filter data from the spreadsheet through arbitrary commands and user programs; ability to create up to 16 windows; dependency-based recalculation; memory protection; help facilities and support for an unlimited number of terminals.

The product costs \$550 per CPU from 348 S. Clark Drive, Beverly Hills, Calif. 90211.

Executive System (Ropes) package for IBM CICS users. Version 5.0 is designed to run under IBM's OS/VS1 and DOS/VSE operating systems.

The package allows distribution of printed output throughout an on-line network under control of CICS terminal operators, a spokesman said. Reports are stored, retrieved, routed and printed in a batch environment under CICS. Version 5.0 adds a menu screen for command entry. This permits the user to see a list of all Ropes printer and supervisory commands and options.

An on-line table-change capability will give users the ability to add, change and delete Ropes printers and reports. A report browse-and-print feature provides the ability to print user-specified portions of the browsed report. In addition, the package provides a "dynamic queue space recovery" feature that allows the user to delete data on-line.

Ropes Version 5.0 costs \$20,000 for OS/VS environments and \$10,500 for DOS/VS environments. Axios Products is located at 2364 Middle Country Road, Centereach, N.Y. 11720.

'Pastran' Turns Pascal Programs Into Janus/Ada

MADISON, Wis. — RR Software, Inc. has announced the release of Pastran, a product that takes existing Pascal programs and mechanically translates them into Janus/Ada, the company said.

Standard Pascal programs are accepted by the translator, as well as extensions of Pascal MT and Pascal M, the vendor said. All original comments and variable names are preserved. The program is available on Digital Research, Inc. CP/M and CP/M-86 and Microsoft, Inc. MS-DOS formats.

Pastran is priced at \$75, according to the vendor. Additional information is available from RR Software, which may be reached through P.O. Box 1512, Madison, Wis. 53701.

Short Course On Unix Announced

FORT COLLINS, Colo. — Colorado State University has announced a videotaped short course on the Unix operating system.

In 10 half-hour lectures, the course covers more than 60 of the most frequently used Unix commands, according to a spokesman for the university. It is intended to provide a working knowledge of the most important features of Unix and to teach viewers how to build commands from the Unix repertoire.

The Unix course can be leased for \$930 or purchased for \$3,625 from the Engineering Renewal & Growth Program at Colorado State University, Fort Collins, Colo. 80523.



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SMC Software Systems has earned a reputation for providing high quality computer-based

software products in the industry. SMC Basic, an easy to use but powerful Business Basic, has become a standard for 16-bit UNIX-based computers. Since it is a compatible version of the widely popular Business Basic III (BBIII) programming language, application programs developed under BBIII will run under SMC Basic.

The System 8000 is a growing family of totally compatible, multi-user 16-bit micro-computers designed for high-performance and reliability. This UNIX-based family is priced starting from under \$15,000, and features three models: the 11, the 21, and the 31 with optional 9-track tape and/or peripheral products.

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Compac Systems Offers Tools for DG, Bluebird

PALATINE, Ill. — Compac Systems, Inc. has announced two new software packages for Data General Corp. and Bluebird Systems Corp. computers; a new release of its 3*16 Word Processor package; and the 3*16 Data Station, a bundled hardware/software package.

Smooth Spreading is a spread-

sheet package that supports up to 702 columns and 999 rows, a spokesman said. Models may be saved, recalled, copied and merged; and a link is supported to receive data from outside data bases. Calculation and logic functions include: if, minimum, maximum, count, sum, absolute value, average, add, subtract, divide, multi-

ply and exponent. It costs \$395.

SPSpell is a stand-alone spelling verifier that can verify the spelling in text files and can be used as a spelling checker on documents created by most DG-compatible word processors and editors. A 26,000-word spelling dictionary is used, and misspelled words may be corrected on the screen or flagged for later correction. It costs \$295.

The 3*16 Data Station is a workstation that includes the Compac's 3*16 Word Processor with spelling dictionary, a DG-compatible CRT and full-width, heavy-duty 200 char./sec draft and 45 char./sec letter-quality printer. A single cable is required to connect the station to the host DG computer running DG's DOS, Rdos

or AOS operating systems. It costs \$3,995.

Release 3.0 of the 3*16 Word Processor includes 14 new functions, improved execution speed, reduced I/O requirements and virtual text handling, the spokesman said.

New features include overprinting, variable pagination titles, justification of paragraphs with inverted indentation, jump to end of line, direct printer controls and expanded print-time document assembly functions. With spelling dictionary on DG systems the package costs \$1,400. For Bluebird systems, the price is \$750.

All products are available from Compac at 59 E. Cunningham Drive, Palatine, Ill. 60067.

Video Self-Study Program Boosted for MVS/SP Users

AVON, Conn. — Computer Systems Research, Inc. has upgraded its video self-study training program for users of IBM's MVS/SP operating system to include information about IBM's MVS/XA operating system.

Designed for technical, supervisory and systems personnel without detailed MVS backgrounds, the MVS/SP/XA video course comes with 70 specific video modules and workbooks. The package covers MVS internals such as multiprocessing functions, I/O management in MVS, communications between address spaces, error recovery and additional MVS functions, the vendor said.

The MVS/SP/XA training package can be used for new systems programmers, existing staff and managers responsible for planning, implementation and support of MVS/SP or MVS/XA in a production environment. The course material is a refined version of the MVS material contained in IBM educational SP or XA courses, the vendor said.

The entire package can be purchased for \$36,000, and individual modules can be purchased for \$600 to \$800 each. Subsets of the total course

cost between \$1,500 and \$12,000, Computer Systems Research said from Avon Park S., 40 Darling Drive, Avon, Conn. 06001.

Accounting Tool Enhanced For DEC System

GLENDALE, Calif. — Theta Business Systems has announced an enhanced version of its accounting package for users of Digital Equipment Corp.'s RSX-11M-Plus operating system.

The accounting package has been written in Pascal and includes six modules: general ledger, accounts receivable, accounts payable, payroll, order entry with inventory control and billing and sales analysis, the vendor said.

The package costs \$1,495 per module from Theta Business Systems at Suite 106, 1110 Sonora Ave., Glendale, Calif. 91201.



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Combines Management Functions

Fusion/36 Runs on IBM System/36

LARKSPUR, Calif. — Fusion Products International has announced Fusion/36 Management Information Center, a software system for the IBM System/36 that combines information management, report writing, data dictionary, file maintenance and graphing functions.

Using Fusion/36, a user can access any information in the data base, write an individually specified report and create graphics, a spokesman said. Fusion/36 offers a complete media-independent retrieval processor that supports a variety of output devices. Functioning as a centralized data base facility with data dictionary, the system can be set up as a stand-alone personal filing system. The data base facility may also be utilized in developing new applications, providing the access and retrieval capabilities of System/38.

A Link Access feature provides an extended accessing

method for large-scale applications. This allows a single retrieval to follow pointer chains that are common to integrated systems. Acting as an intermediary between incompatible software, Fusion/36 allows users to move data to and from any file within the System/36, the spokesman said.

Other features include real-time queries of up to eight files at once, decision

support graphics, automatic audit trail and on-line maintenance tools and data entry design facility. Enhancing existing applications on the IBM System/3, System/32 and System/34 can be accomplished without reprogramming, the company claimed.

A single-copy license price of Fusion/36 is \$3,600 from Suite 105, Larkspur Landing Circle, Larkspur, Calif. 94939.

Comparison Utility Receives Release 4.4

SACRAMENTO, Calif. — Software Module Marketing, Inc. (SMM) has announced Release 4.4 of Comparex, a comparison utility for IBM OS and DOS operating systems.

The new version has the capability to make direct comparisons of any two spe-

cific members of Pansophic Systems, Inc.'s Panvalet and Applied Data Research, Inc.'s Librarian files, a spokesman said. The enhancement also allows a specific member of one proprietary file to be compared to a specific member of a different proprietary file. Single or group members of a partitioned data set can be compared to Panvalet or Librarian directories, and any sequential data set can be compared to a member of either product.

Also included is an exit module to Comparex with instructions for custom tailoring to enable direct access to any proprietary data base management system, the spokesman said. This feature allows comparisons from data base to data base and from data base to backup, which highlight any inserted, deleted or modified fields.

The enhanced product is scheduled for release in the fourth quarter of 1983 at a price of \$8,000 for OS and \$4,000 for DOS from SMM at Crocker Bank Building/Penthouse, 1007 Seventh St., Sacramento, Calif. 95814.

Atris Handles Internal Control

NEW YORK — Electronic Methods & Solutions, Ltd. has announced Atris, a system for internal control over computer operations.

Atris is an on-line, real-time tool that provides hardware and software trouble reporting, systems status and utilization report capabilities, systems and vendor reliability data, a capital and leased equipment inventory data base, vendor invoice verification, a project and task management program and other features, the vendor said.

The product licenses for \$50,000 from Electronic Methods & Solutions, located at Suite 7967, One World Trade Center, New York, N.Y. 10048.

Job Shop Control Package Available for System/36 Users

MINNEAPOLIS — DCD Co. has announced its Job Shop Control package for IBM System/32 and System/34 processors is now available for users of IBM's System/36 processor.

The modules available include: job costing, inventory control, purchase order, payroll, accounts payable, accounts receivable and general ledger.

Each module can run as a stand-alone package, but full power is reportedly realized when all modules are in one package.

The complete Job Shop Control package costs \$11,500. The job costing package costs \$650, and each of the remaining modules costs \$1,400 each from DCD at 1601 W. River Road N., Minneapolis, Minn. 55411.

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Program Editor for CICS Will Compete With ICCF

MINNEAPOLIS — A program-editor system for IBM DOS/VSE CICS users has been announced by B.I. Moyle Associates, Inc. (BIM).

BIM-Edit was designed to be a high-speed and cost-effective alternative to IBM's ICCF, providing powerful and easy-to-use editing and programming functions for both professional programmers and end users, the vendor said.

The company said the package includes functions such as full-screen, split-screen and multiple concurrent edit sessions per user; global scan and change; text line shifting and splitting; job submission and queue display; and procedure processing.

Other features, according to BIM, are automatic recovery after computer or CICS failure, program library backup without disrupting use of the

on-line editor functions, fast exit from the editor to CICS functions and power pool queue access.

Bim-Edit may be purchased for \$9,600 or leased for \$4,700 per year or \$470 per month from B.I. Moyle Associates, 5788 Lincoln Drive, Minneapolis, Minn. 55436.

'VSEE' Performance Monitor Updated for DOS/VSE Users

KANSAS CITY, Mo. — Little Blue Systems, Inc. (LBS) has announced Version 2.0 of VSEE, a real-time system and partition performance monitor for IBM DOS/VSE Release 2 or 3 systems. VSEE can be installed as a CICS/VS transaction or can be exe-

Natural/Vsam Interface Out

AURORA, Colo. — Users of Software AG of North America, Inc.'s Natural programming language can access IBM Vsam files in their Natural programs in either batch method or on-line under DNA Systems, Inc.'s TSO or Software AG's Com-Plete with the recently announced version of M.B. & Associates Natural/Vsam interface utility.

Users of the product, VNATB, re-

portedly can easily read, browse, retrieve, add, change or delete records on any Vsam files.

The utility runs on any IBM system running under OS and is available for \$2,950 on a perpetual license from M.B. & Associates, 97 S. Nome St., Aurora, Colo. 80012.

Wang VS Series Receives 'SCSS'

CHICAGO — SPSS, Inc. has announced that its conversational information management package, SCSS, is now available for users of Wang Laboratories, Inc. VS series processors.

The SCSS package currently operates on the VS45, VS85, VS90 and VS100 systems. The vendor said the package will eventually be available for the entire VS series.

Used as an integrated, stand-alone package, the software provides statistical and data analysis functions. Help commands and error-recovery procedures are built in to aid the user. In addition, SCSS offers a variety of statistical capabilities including: univariate analysis, cross-tabulations, T-tests, scatter plot, correlation, multiple regression, analysis of variance, breakdown and factor analysis, the vendor said.

The package costs \$6,000 for an initial license fee. An annual renewal fee is \$4,000, SPSS said from 444 N. Michigan Ave., Chicago, Ill. 60611.

Sales Tool for HP 3000 Bows

MONTROSE, Calif. — A management tool for planning sales strategies and tracking results using the Hewlett-Packard HP 3000 has been announced by Mini-Computer Business Applications, Inc. (MCBA).

The sales/history package is written in Cobol with HP's Image and uses the data and results gen-

erated by the MCBA accounts receivable and customer order processing packages to create a total of 19 reports, MCBA said.

A source code license for the package is available starting at \$2,000 for use on a first computer. More information is available from MCBA at 2441 Honolulu Ave., Montrose, Calif. 91020.

cuted in an interactive computing and control facility interactive partition, according to LBS.

The package allows users to watch programs execute, with two displays showing the number of I/Os issued to each device, the job name and description, the phase name, the CPU time used and current processing status and the current assignments of up to 10 tape drives.

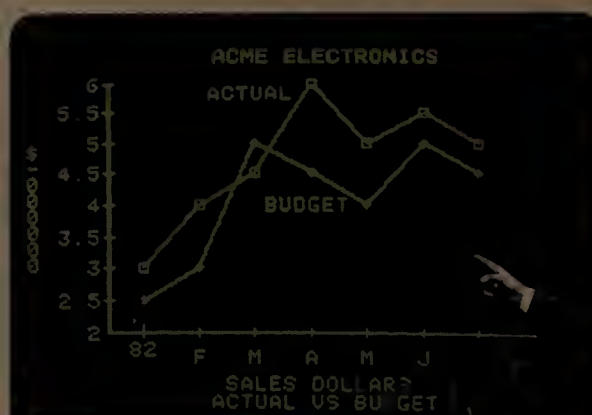
A device status display lists tape drives, disk drives and other devices, showing the assignment and the volumes currently in use, LBS said. Additionally, there is an expanded model and program display and a display showing what is currently displayed on the system data, operations and control console.

The package can be leased for \$600 a year from LBS through P.O. Box 19867, Kansas City, Mo. 64141.

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Electrohome EDP 57 has achieved worldwide success in monochrome computer projection for training sessions, sales meetings, boardroom decisions and other group presentations.

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Generates Cobol Programs

'Forge' Fits Prime Series 50

PHOENIX — A Cobol generator said to increase programmer productivity dramatically for Prime Computer, Inc. Series 50 computers has been announced by Systems Formation, Inc.

A spokesman for the vendor said that during a four-hour test of the Forge generator, 4,824 keystrokes of programmer input produced 4,885 lines of debugged Cobol source, including embedded comments, and produced as a by-product 41 pages of documentation.

Transaction processing programs generated by Forge reportedly include add, change, delete file maintenance and file inquiry; file merge programs; report programs; and menu programs. All generated programs can be modified in source form by the user, the company said.

The generator is available for \$18,500, including training, from Systems Formation, 2131 E. Broadway, Tempe, Ariz. 85282.

DSSD Conference to Focus On Systems Development

TOPEKA, Kan. — Trends in user-focused systems development will be the topic of Feedback, the eighth annual Data Structured Systems Development (DSSD) Users Conference to be held here Oct. 11-13.

Jerry Weinberg, a lecturer and author, will talk about "The Human Side of Systems Analysis." J.-D. Warner, an information scientist from Paris, will discuss "Data Systems That Answer Users' Needs."

In addition, breakout sessions on project management, systems planning, methodology installation, requirements definition, data base design and productivity will be held.

Other speakers and topics include Ken Orr, president of Ken Orr & Associates, Inc., on "User-Focused Systems Development"; T. Capers Jones of the ITT Programming Technology Center, on "Demographic Trends in the Use of Computers"; Gordon Davis of the University of Minnesota, on "Caution: User-Developed Systems May Be Hazardous to Your Organization"; Francis Frank of Keane Associates, on "Project Management and Its Effect on Your Organization"; and Hugh Ryan of Arthur Anderson & Co. and Marge Hayes of Northwest Industries, Inc., on "An Evolutionary Development Methodology for High-Level Languages."

The registration fee is \$500 from Ken Orr & Associates, 1725 Gage Blvd., Topeka, Kan. 66604.

Abstract/38 Version Debuts For IBM CPF Release 5.0

WHEELING, Ill. — Advanced Systems Concepts, Inc. has unveiled a version of its Abstract/38 documentation and productivity system for Release 5.0 of IBM's CPF operating system running under the firm's System/38 processor.

Under the latest release, control language analysis is performed at the object level instead of the source code level. This is said to provide a significant performance improvement over the previous release. Another new feature is the software's ability to provide information on data base command usage, file overrides, usage of the reformat command and file and number management.

Program-level documentation for the package includes: program flowcharts, procedure explosion reports and inquiries, "where-used" listings, sample report outputs and source code listings. All programs on the system, such as RPG and Cobol, can be analyzed, a spokesman said.

Abstract/38 data base information is reported for both external file descriptions and internally described RPG program descriptions. Data base structures are thoroughly referenced in file dependency reports and usage reporting, the spokesman pointed out.

Abstract/38 comes with a 60-page user manual and is available on a two-week trial basis. The one-time license fee is \$1,000 from the firm at 1084 Cornell, Wheeling, Ill. 60090.

Deltak Offers Four Courses

NAPERVILLE, Ill. — Deltak, Inc. has announced four multimedia courses for system programmers in the MVS environment.

The first course in Series 19-3XX, "System Programmer Basics," is an overview entitled "Installing and Initializing the System." "Maintaining System Software," the second course, offers information about systems maintenance procedure and the system maintenance cycle. The third and fourth courses are "Handling System Problems" and "Tuning the System."

"System Programmer Basics" is available for purchase or rent. Courses cost \$50 to \$125 per month per course. They can be purchased at \$1,750 each from Deltak at the East/West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

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Micro Notes

Amber Systems has released its **Virtual Screen Interface (VSI)**, a software library which provides high-screen window management for the IBM Personal Computer and IBM-compatible machines. VSI requires 11K bytes of memory (plus up to 65K bytes for screen buffers) and will run on systems with 65K bytes or larger bases with or without hard disks. It supports both color and monochrome screens but does not support bit-mapped graphics. VSI is not an end-user product, according to a

company spokesman, but is intended for use by programmers developing software for the IBM Personal Computer. It is available for \$295 from Amber Systems at 811 Alderbrook Lane, Cupertino, Calif. 95014.

The Creator, a software package designed to tailor a variety of applications to the particular requirements of a user who possesses virtually no programming knowledge, has been released by Software Technology for Computers, Inc. The Creator

has 10 ready-to-customize work areas and can be used on the IBM Personal Computer, the Apple Computer, Inc. Apple II or Apple IIe, the Compaq Computer Corp. Portable Computer and many IBM-compatible personal computers. It is available through major software distributors nationwide at \$300 for the IBM and Compaq versions and \$250 for the Apple II or Apple IIe.

Terminals, Inc. has announced price reductions on its

CIG-201 monochrome and **CIG-261** color plug-in graphics cards. The CIG-201's single-quantity price has been reduced 33% to \$795 while the CIG-261 is available for \$995, a 17% decrease. The Digital Equipment Corp.-emulating and Tektronix, Inc.-compatible cards are available from Terminals, Inc. at 2505 McCabe Way, Irvine, Calif.

The **Business Planner** business modeling package, which provides a simulated model for the projection of monthly in-

come/expense figures, budget allocations and sales forecasts, has been released by the Duo-soft Corp. Designed as an aid in starting a new business or expanding an existing firm, the **Business Planner** is available for the Apple Computer, Inc. Apple II and Apple III and the IBM Personal Computer. Priced at \$395, the package is available from Duo-soft at 1803 Woodfield Drive, Savoy, Ill. 61874.

Blue Ribbon Electronic Publishing has announced **Easykeys**, a program which allows Televideo Systems, Inc. users to define, change and save up to three sets of definitions for the system function keys. The definitions can be systems commands, programming statements, application commands or commonly used words, phrases or numbers. Easykeys runs on any Televideo 800 series system and requires 64K bytes of random-access memory and one disk drive. It can be purchased for \$49.95 from KLS, Inc., through P.O. Box 1041, Manchester, N.H. 03103.

Secure is an encryption program which transforms files into garbled characters that can only be unscrambled using the same keys. Files can be encrypted more than once for extra security. It is available for \$49.95 and is distributed by Word-movers, Inc., 15818 Hawthorne Blvd., Lawndale, Calif. 90260.

Opus-1, Computer Automation, Inc.'s (CA) multiuser, multitasking operating system, has been enhanced to make it compatible with Digital Research, Inc. CP/M-based application software programs running on the CA line of Omnix desktop computer systems. The enhancement also adds type-ahead capabilities and a master-menu-handling utility. Opus-1 costs \$590 from the vendor at the Naked Mini Division, 18651 Von Karman, Irvine, Calif. 92713.

Software 128 has introduced **Metabasic**, a comprehensive precompiler Basic. Full argument passing is supported and subroutines may be nested to any level. Other features include: named global common, data declaration, structured conditional program control and simplified file I/O using record data constructs. Metabasic is available for the IBM Personal Computer at \$59 from the vendor at 363 Walden St., Concord, Mass. 01742.

Logical Systems, Inc. has released Micropro International Corp.'s **Wordstar** on the Small-dos operating system. All Wordstar features except background printing are available, and Micropro's text processing system, **Mailmerge**, can be added. The introductory prices, in effect until Dec. 31, are \$249 for Wordstar and \$149 for Mailmerge. It is available for the Radio Shack TRS-80 Models 1, 2 and 4 (in the Model 3 mode) and the Lobo Systems Max-80 (Max-80 Ldos required) from Logical Systems at 8970 N. 55th St., P.O. Box 23956, Milwaukee, Wis. 53223.

HEX 'FF,' Inc. has released **Graf/Hex**, a screen-oriented business graphics package



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Micro Notes

which is available in Basic Four Basic and SMC Basic versions operating on Unix-based micros and minicomputers. Features include charts that can be produced in eight colors (or shaded patterns on monochrome terminals), pie, line and bar chart formats, multiple graphs on a single chart and resizing and/or relocation of graphics or text material. Charts can be named and saved for future use or revision. The package for Basic Four costs \$1,995, and the SMC version is \$995, according to the vendor at Suite 20, 2637 Centinela Ave., Santa Monica, Calif. 90405.

Hemenway Corp.'s M68000 Basic Interpreter is now available for use on single and multiuser Motorola Inc.'s Versados systems. The package consists of the Hemenway/Basic interpreter object code on a Versados-compatible floppy diskette, extensive user documentation and a one-year paid-up maintenance and support fee for \$1,500 for the first copy and \$750 each for subsequent copies for use at the same site. The package is available from 101 Tremont St., Boston, Mass. 02108.

Keyboard Productivity, Inc. (KPI) has introduced Accutouch, a tutorial package intended to help personal computer owners minimize the time they spend inputting alphanumeric or numeric data. The five, one-hour lessons are a self-paced version of the training course developed and taught on-site by KPI for users of minicomputers, calculators, word processors, typewriters and other keyboard-operated equipment. The package, which is available for the Apple Computer, Inc. Apple II, Apple II+, Apple IIe and all IBM Personal Computer models, costs \$269 from the vendor at Suite 419, 4676 Admiralty Way, Marina del Rey, Calif. 90291.

Cdex Corp. has announced the "Managing Your Business" series of computer-based training products for the IBM Personal Computer. Designed to help the user maximize the electronic spreadsheets Lotus 1-2-3, Multiplan, Visicalc and SuperCalc, each product contains

training and tools to analyze sales forecasting, product margins, budgeting, cash flow, materials requirement planning, accounts receivable and payable and return on equity analysis. It costs \$69 and is being distributed by Cdex at Suite 200, 5050 El Camino Real, Los Altos, Calif. 94022.

Digital Research, Inc. has introduced DR Graph, an interactive graphics and editing tool that reportedly develops slide presentations, trend charts and

financial analysis reports. Running under the vendor's CP/M operating system for the IBM Personal Computer, DR Graph is priced at \$295 from Digital Research, Box 579, 160 Central Ave., Pacific Grove, Calif. 93950.

PMI, Inc. has introduced Microscreens, a screen generator package said to allow the operator to produce clear screen formats using Basic. Priced at \$119, Microscreens is available from PMI at Box 87, Buckfield, Maine 04220.

Calcu-Plot, a mathematical-utilities package that transforms equations into graphics, is available for the Apple Computer, Inc. Apple II and Apple IIe computers from Human Systems Dynamics. The program accepts data from keyboard, disk files and print format Visicalc files. Solved equations can be plotted one at a time or in sets of two or three, all on the same graph. Calcu-Plot costs \$150 and is available from Suite 222, 9010 Reseda Blvd., Northridge, Calif. 91324.

Montezuma Micro has announced an implementation of Digital Research's CP/M 2.2 operating system for the Radio Shack Model 4 computer. The system functions in either a 64K byte or 128K byte Model 4 and includes an "interchange" utility that is said to read, write or copy over 20 diskette formats including IBM, Kaypro, Inc. Osborne Computer Corp. and Xerox Corp. It comes complete with all utilities and a 300-page user manual for \$199.95 from (Continued on Page 116)



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Micro Notes

(Continued from Page 115)

Montezuma Micro, located at Redbird Airport, Hanger 8, Dallas, Texas 75232.

IBM has introduced four programs for its Personal Computer family. They are: **IBM Personal Computer Word Proof**, a text spelling-check program that includes a 125,000-word dictionary and a thesaurus; **IBM Personal Computer Mailing List Manager**, which allows a user to enter, store and print on labels; **IBM Personal Computer Visicalc 1.2**, an updated version of the Visicorp Visicalc 1.1 electronic work sheet; and **Exploring the IBM Personal Computer**, an introductory tutorial diskette that is being included with all IBM Personal Computer system units. Word Proof sells for \$60, Mailing List Manager for \$915 and Visicalc 1.2 for \$200 at IBM product centers.

Data Technology Industries (DTI) has introduced three new computer programs: the **Talker**, which allow users of DTI's Associate microcomputer to transfer files to and from mainframe computers and sells for \$175; **Move It**, which allows files to be moved from one computer to another, for \$175; and the **Remote Batch Terminal Emulator**, priced at \$500, which gives the Associate the ability to use a bisynchronous protocol and "speak" to IBM mainframe computers. The programs are available from the vendor at 701A Whitney St., San Leandro, Calif. 94577.

Graphic Communications, Inc. has announced the immediate availability of Version 3.1 of its **Graphwriter** presentation graphics package for the IBM Personal Computer and IBM Personal Computer XT. The package reportedly

expands support to three additional plotters: IBM's X/Y749, California Computer Corp.'s Calcomp 84 and the Sweet-P from Enter Computer, Inc. The upgrade will be sent to registered users at no charge, and others can purchase the Graphwriter package for \$395. The vendor can be reached at 200 Fifth Ave., Waltham, Mass. 02254.

Micropro International Corp. has reduced update prices to \$25 each for **Mailmerge** and **Spellstar**, which must be updated to run with Version 3.3 of Wordstar, and to \$60 for **Calcstar**; **Wordstar** update is priced at \$85. Update authorization cards should be obtained from retail outlets or from the vendor at Update Department, P.O. Box 4960, San Rafael, Calif. 94913.

A spelling checker with a 43,000-word dictionary, **Spellix**, has been introduced by Emerging Technology Consultants, Inc. for use as a stand-alone product or in combination with its Wordix text formatter and Edix word editor. The package requires 128K bytes of random-access memory and is available in formats for the IBM Personal Computer and compatible systems and microcomputers offered by Texas Instruments, Inc.; Victor Business Products, Inc.; Zenith Data Systems, Inc.; and Digital Equipment Corp. List price for Spellix is \$95, and information is available from the vendor at 2031 Broadway, Boulder, Colo. 80302.

Video Display Terminal Emulator (VDTE) Version 2 enables IBM Personal Computers and Personal Computer XTs to emulate Hewlett-Packard Co. HP 2624 and HP 2648 terminals and Digital Equipment Corp. VT52 terminals. It re-

quires 128K bytes of memory, 80-col. display, one diskette drive and IBM PC-DOS version 1.00, 1.05, 1.10 or 2.00, and is available for \$200 from Inner Loop Software, Inc., P.O. Box 45857-C, Los Angeles, Calif. 90045.

"**Flexi-Bundle**" is a new offer announced by North Star Computers, Inc. whereby purchasers of its Advantage or Horizon microcomputers with 15M-byte hard disks for \$5,999 can select more than \$2,000 of software free; and purchasers of the \$2,999 Advantage or Horizon with two floppy disk drives can select more than \$1,100 of software free. Information is available from North Star at 14440 Catalina St., San Leandro, Calif. 94577.

A **MAG/Base** version for Microsoft, Inc. MS-DOS systems has been announced by MAG Software, Inc. The data base management software for personal computers is available in three versions from entry level to advanced professional for \$295, \$495 and \$795. The vendor is located at Suite 305, 21054 Sherman Way, Canoga Park, Calif. 91303.

PC-B4 enables an IBM Personal Computer to be used as a terminal on a Basic Four Information Systems Division, Management Assistance, Inc. computer. The package enables downloading and uploading of data between the Personal Computer and host and provides all the functions of a standard Basic Four video display terminal. It is available for \$300 from Sigma Computer Resources, a division of Sigma Resource Consultants Ltd., 801-1155 W. Georgia St., Vancouver, British Columbia, Canada V6E 3H4.

Avocet Systems, Inc. has announced a line of **Microprocessor Cross-Assemblers** for IBM Personal Computers and others based on the Intel Corp. 8086/8088 central processor. The cross-assemblers are available under Microsoft, Inc.'s MS-DOS, IBM's PC-DOS and Digital Research, Inc.'s CP/M 86 in prices ranging from \$200. Avocet is located at 804 S. State St., Dover, Del. 19901.

Blue Chip 1: An Introduction to Micro-Application will be released in October as a two-diskette, IBM-compatible software package teaching the novice user key concepts and practical business skills in easy lessons. The package has a suggested list price of \$95 and is the first in a new line of lesson programs from Micro Courseware Corp., Suite 300, 4444 Geary Blvd., San Francisco, Calif. 94118.

Azurdata, Inc. has introduced a software development system (**ASDS**) for the Scorepad hand-held portable computer/terminal. Based on the UCSD Pascal Version 2.1 P-System and running on any user-supplied IBM or IBM-compatible personal computer, ASDS costs \$2,600 from Azurdata at 4102 148th Ave. N.E., Redmond, Wash. 98052.

Canned Software Corp. has announced a Cobol source code generator that reportedly can be used on most microcomputers compatible with Digital Research, Inc.'s CP/M operating system. Besides generating clean source code, the **Business Application Generator (BAG)** also self-generates an operator's guide, the company said. Training time ranges from two hours to two days, depending on the user's knowledge level, the vendor said. BAG sells for \$1,995 from Canned Software, Rt. 1, Box 37, Pineville, Mo. 64856.

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an investment holding company, has been formed to invest in proprietary software companies in market segments perceived to have significant growth potential. The initial market segments that Newtrend will focus on are companies marketing Decision Support software, productivity tools, fourth generation languages, business applications for selected vertical industries and selected micro-based business software.

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The company also has established a Technology Council of key executives throughout the industry to advise on acquisitions.



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LSI-X.25 Front End Ready to Interface With VAX-11/730

LONDON, Ont. — Cablesare, Inc. has announced that its LSI-X.25 front-end processor is now available for use with Digital Equipment Corp.'s VAX-11/730 minicomputer under the VAX/VMS V3.3 operating system.

The LSI-X.25 front-end processor is said to interface VAX-11 computers to public and private packet-switched networks. A direct memory access interface to the host computer eliminates the need for communications port hardware and increases the CPU processing capacity, according to the vendor. The host is reportedly relieved of processing any portion of the X.25 protocol; all three levels are handled within the LSI-X.25 front end.

Several options are available with the front end including IBM high-level data link control, multiple network links, data terminal equipment and data communications equipment support, the vendor said. In addition, network management software is provided to monitor and record X.25 statistics and alarms and to download diagnostic and operational software.

The LSI-X.25 front-end processor is also available for DEC's PDP-11 computers. Pricing starts at \$11,000.

Cablesare is located at 20 Enterprise Drive, P.O. Box 5880, London, Ont. N6A 4L6.

Line of Modems Developed in UK Available in U.S.

ALEXANDRIA, Va. — A line of modems developed in the UK and manufactured in the U.S. under a licensing arrangement has been announced by Combyte, Inc.

The Interlekt line, according to Combyte, is immediately available in 1,200-, 2,400- and 1,200/300 bit/sec models that are Bell-compatible and conform to CCITT standards.

The devices feature autodial, autoanswer, asynchronous and synchronous options.

Suggested list prices start at \$525. Combyte is located at 4810 Beauregard St., Alexandria, Va. 22312.

Intecom Scales Down PBX For Use in Small Businesses

By Jim Bartimo
CW Staff

ALLEN, Texas — Intecom, Inc. has introduced a scaled-down version of its Integrated Business Exchange (IBX) private branch exchange (PBX) designed for smaller businesses and branch offices of larger businesses.

The IBX S/10 is said to feature the same voice- and data-switching capability as the higher end IBX S/80 with as few as 250 lines. Voice and data are switched over twisted pair wire, which eliminates the need for coaxial cabling in networking, an Intecom spokesman said.

The S/10 also features a nonblocking architecture with simultaneous voice and data transmission, protocol translation, format conversion, data switching with a modem, remote switching and local-area networking.

The switch also supports other IBX advanced features including:

- Voice-feature set ranging from individual station to least-cost routing.
- Software support for upcoming "equal access" requirements to the AT&T restructuring.
- Local-area networking for burst-mode data devices up to 10M bit/sec through Intecom's Lanmark system.
- Ansi X.25 gateways to public data networks.
- Computer-to-PBX interface, RS-232, RS-449 and V.35 interfaces for data device connection.

The S/10 is said to be "99% software-compatible with the larger system. If you had an S/10, you could grow into an S/80," according to R.W. Corcoran, Intecom director of marketing.

Thomas H. Aschenbrenner, senior vice-president of switching products, said, "The larger IBX products have typically been installed at large corporations, hospitals and universities with more than 1,000 lines. Smaller organizations desire the same economies that our larger customers are reporting with the IBX.

"The IBX S/10 offers a single-system solution for office integration allowing multivendor office products and voice communications to share a universal two-pair telephone-wiring plan," Aschenbrenner noted.

The S/10 will be available in the second



Intecom, Inc.'s IBX S/10

quarter of 1984 for \$800 to \$1,100 per line from Intecom, 601 Intecom Drive, Allen, Texas 75002.

Processor Emulates IBM Controllers

MIAMI — A communications processor that enables a keyboard send/receive device or asynchronous Ascii host to function as IBM 3277-1, 3277-2, 3278-1 or 3278-2 terminals communicating with IBM hosts has been announced by Innovative Electronics, Inc.

The MC-80/602 communications processor emulates several IBM communications controllers: 3271, Models 1 and 2; 3274-51C; and 3276, Models 1 and 2, according to Innovative Electronics.

The processor provides up to 16K bytes of read-only memory, 16K bytes of random-access memory and one serial communications port. The basic price is \$1,650, and delivery time is 30 days. More information is available from Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

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VT100s to Graphics

DEC Can Emulate Tektronix



DQ640 series upgrades DEC VT100s to emulate Tektronix terminals.

SACRAMENTO, Calif. — Digital Engineering, Inc. has introduced a terminal enhancement designed to upgrade Digital Equipment Corp. VT100 terminals to emulate Tektronix, Inc. 4010 and 4014 graphics terminals.

The DQ640-Series Retro-Graphics terminal enhancements are printed-circuit card and CRT assemblies that install in DEC terminals and are compatible with programs written for Digital Engineering's VT640 series Retro-Graphics for DEC displays, a vendor spokesman said.

The enhancements are available for between \$970 and \$1,195 from Digital Engineering, 630 Bercut Drive, Sacramento, Calif. 95814.

IBM Micro Tied to Host For Distributed System

JEFFERSON CITY, Mo. — Software Systems, Inc. has announced a product to support distributed data processing (DDP) with IBM Personal Computers communicating to an IBM System/34, System/36 or System/38 host.

The Emulator Transfer Utility (ETU), working with the company's 5251 Model 12 remote workstation emulator for the Personal Computer, is said to support the interchange of data files between the host system and the IBM Personal Computer or Personal Computer XT, giving the user a functional, low-cost DDP capability with the IBM micro, the vendor explained.

A set of procedures are provided with the ETU to support file transfer in either direction with optional allocation, deletion, renaming and existence testing of files on the Personal Computer. A translation facility supports multiple byte scan/replace with user-alterable translation tables, the vendor said.

The ETU is also available for use with IBM Personal Computer plug-compatibles. It costs \$400 for the System/34, \$500 for the System/36 and \$800 for the System/38 from Software Systems through P.O. Box 1766, Jefferson City, Mo. 65102.

Private Net Announced To Link Banks

ROLLING MEADOWS, Ill. — The Independent Bankers Association of America (IBAA), which represents some 7,000 banks nationwide, has announced the establishment of a private electronic communications network with its members through Innerline, a computer-based management support service for banking.

Innerline is a joint venture of the *American Banker*, the daily banking newspaper, and Bank Administration Institute. It provides 40 finance-related on-line services in the areas of management, financial and funds management, retail and trust banking, microcomputers, commercial lending and correspondent banking, bank operations, strategic planning, compliance and legal issues and auditing.

IBAA Executive Director Kenneth Gunther said Innerline will enable the IBAA to offer same-day legislative updates to members, while providing them access to the most comprehensive financial information system available in the banking community. He added that the IBAA is working with Innerline to develop a commodities pricing program.

Further details on Innerline may be obtained from its headquarters at 60 Gould Center, Rolling Meadows, Ill. 60008.

Modem Series From Ven-Tel Gets Price Cuts

SANTA CLARA, Calif. — Ven-Tel, Inc. has announced price reductions, effective Sept. 1, ranging from 19% to 37% for its entire family of Bell 212A-compatible direct-connect modems.

The Ven-Tel 212 Plus II (Model MD212-5E) has been reduced to \$625 from \$995; the Plus II rack-mounted card has been reduced to \$585.

The Ven-Tel 212 Plus (Model MD212-3E) has been reduced to \$495 from \$795; with the MD212 Plus rack-mounted card reduced to \$445 from \$725. The Ven-Tel MD 212-1E is now priced at \$445, down from \$550.

Ven-Tel is based at 2342 Walsh Ave., Santa Clara, Calif. 95051.



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The Passport is portability taken seriously. Compact and light-weight, it stows beneath an airline seat in a rugged travel case. Its typewriter-style, fully-configured keyboard tucks away when you're not using it, saving space.

Yet the Passport is a portable powerhouse. It tackles complex business problems. Quickly. With Intel 8088 16-bit processing, 256K bytes of user RAM, and 640K bytes of IBM PC-compatible diskette storage.

The Passport's industry-standard MS-DOS operating system runs most IBM PC-compatible software including BASIC A and other powerful packages for financial modeling, text editing, communications management, graphics and programming.

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Passport's features combine comfort, convenience and performance for unequalled versatility. A non-glare, high resolution amber screen. A 300 baud built-in modem. Ten soft keys. And built-in, pushbutton tutorials such as "help" and "explain."

The Passport expands easily with a broad line of AJ peripherals including full-size monitors, high-speed modems,

terminals and printers. So installing and maintaining a company-wide system is less complicated, less costly.

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Wall Industries' Data-Transfer Switches

To Provide Flexibility

Wall Offers Data Transfer Switch

LAWRENCE, Mass. — Wall Industries, Inc., a manufacturer of power supplies, communications cables, connectors and accessories, recently expanded its product line to include data transfer switches.

The transfer switches will reportedly provide communications flexibility by eliminating the need for cable removal when one computer

shares two devices. Switch applications include connecting two terminals to one modem, one word processor to two peripherals or two micros to one printer.

The data transfer switches reportedly require no power and are speed- and code-transparent. Features include the RS-232 interface, the 36-pin Centronics, Inc. interface and the coaxial interface.

Pricing on this product line ranges from \$105 to \$149, depending on configuration. Wall Industries is based at 2 Franklin St., Lawrence, Mass. 01840.

ADC0844 Features 8-Bit Cmos

SANTA CLARA, Calif. — An 8-bit Cmos successive approximation analog-to-digital converter has been announced by National Semiconductor Corp.

The device, ADC0844, is designed to operate from the control bus of a wide variety of microprocessors, the vendor said.

National Semiconductor's Tri-State output latches directly drive the data bus and allow the unit to be configured as either a memory location or I/O device, according to a vendor spokesman.

The vendor said the device contains a four-channel analog multiplexer that can be configured in differential, single-end or pseudodifferential modes, with each selected by loading the multiplexer address latch with the proper address.

Single-unit price is \$5.75, the vendor said.

Further information is available through Data Conversion/Acquisition Marketing, National Semiconductor, 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

Converter, Spooler Out

MOUNTAIN VIEW, Calif. — A combined independent interface converter and print spooler that reportedly can be installed between a wide variety of computers and peripherals has been announced by Antex Data Systems, Inc. (ADS).

The ADS-8212 Data Exchange/64 was designed to work with a wide variety of popular microcomputers, according to ADS. Selectable data variables include incoming and outgoing protocols; serial port bit/sec rates from 50 to 19,200; and serial or parallel configuration of data input and output. The print spooler contains 64K bytes of memory.

Buffer memory features include a reset button purge and a copy feature.

The list price of the device is \$329, and delivery takes 30 days. Antex Data Systems is located at 2630 California St., Mountain View, Calif. 94043.

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Our statistical multiplexers provide error-free transmission at speeds up to 19,200 bps, with concentration ratios up to 9 to 1. Models are available from 3 to 52 channels, and 64K bytes of memory. Prices start at \$1550.



Develcon limited distance data sets provide synchronous or asynchronous operation from 1200 to 19,200 bps, over private wire lines or switched networks. Prices range from \$95 to \$1100, depending upon models, and all are offered with a two year warranty.



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These run under VMS or EUNICE for VAX users, or UNIX for PE 3200 users.

IP/TCP Internet Protocol Transmission Control Protocol is the newly adopted Department of Defense standard which provides a set of cooperative processes allowing two or more host computers to communicate.

R/M COBOL is a high-level implementation of the ANSI 74 COBOL standard, designed for efficient development and execution of COBOL business applications. Features include GSA certified COBOL, Level-2 relative and indexed file access methods, plus full arithmetic capability.

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Net Management System Announced for Digital Nets

WALLINGFORD, Conn. — An automated network management and control system for digital networks, including multinode distributed networks with at least 50 lines, has been announced by Dataproducts New England, Inc.

The Cenpat 900 features automatic scanning and real-time alarms. The device reportedly increases user productivity by maintaining increased network throughput and minimizing data communications; it also features automatic testing and restoral.

The device's data base reportedly stores network information such as circuit maps and identifiers, performance parameters, information

about users and test alternatives.

The series 900 is available for \$750 to \$1,000 per circuit from Dataproducts New England, Barnes Park N., Wallingford, Conn. 06492.

Communications Research Meet Set

WARRENTON, Va. — The Twelfth Annual Telecommunications Policy Research Conference will be held April 23-26, 1984, at the Airlie House here.

Participants will be able to discuss current and prospective research on domestic and international telecommunications and information issues.

The deadline for the receipt of pa-

Graphics Board Introduced

ATLANTA — Colorgraphic Communications Corp. has announced a high-resolution bit-mapped graphics board packaged with power supply and a high-resolution, precision in-line color CRT monitor.

The XL-13 is said to provide a flicker-free viewing window of 640

pixels by 480 pixels. The monitor supports high and medium resolution and alphanumeric modes of the IBM Personal Computer. It is designed for use in computer-aided design and manufacturing, process control, energy management and business graphics, a vendor spokesman said.

The 13-in. XL-13 is available for \$3,495 and the 19-in. XL-19 for \$3,995 from Colorgraphic Communications, 2379 John Glenn Drive, P.O. Box 80448, Atlanta, Ga. 30366.

Package Adds Communications To IBM Micro

MINNEAPOLIS — Professional Software Associates has introduced a software package said to transform the IBM Personal Computer into an intelligent terminal and provide communications capability for information access, retrieval and transfer.

CommTalk is said to provide automated access to information retrieval services and public data bases through such features as autodial and automatic logon procedures, according to a vendor spokesman.

It also allows the IBM Personal Computer to act like a smart terminal providing communications with a host mainframe, service bureaus and other microcomputers, while offering complete file and data transfer capability.

The package is available for \$99.95 from Professional Software Associates, Suite 407, 5353 Wayzata Blvd., Minneapolis, Minn. 55416.

TCTS Increases Accessibility Of Envoy 100

OTTAWA — Announcing several enhancements to its Envoy 100 electronic messaging system last month, the Transcanada Telephone System (TCTS) said the system will be more accessible to small businesses and home computers.

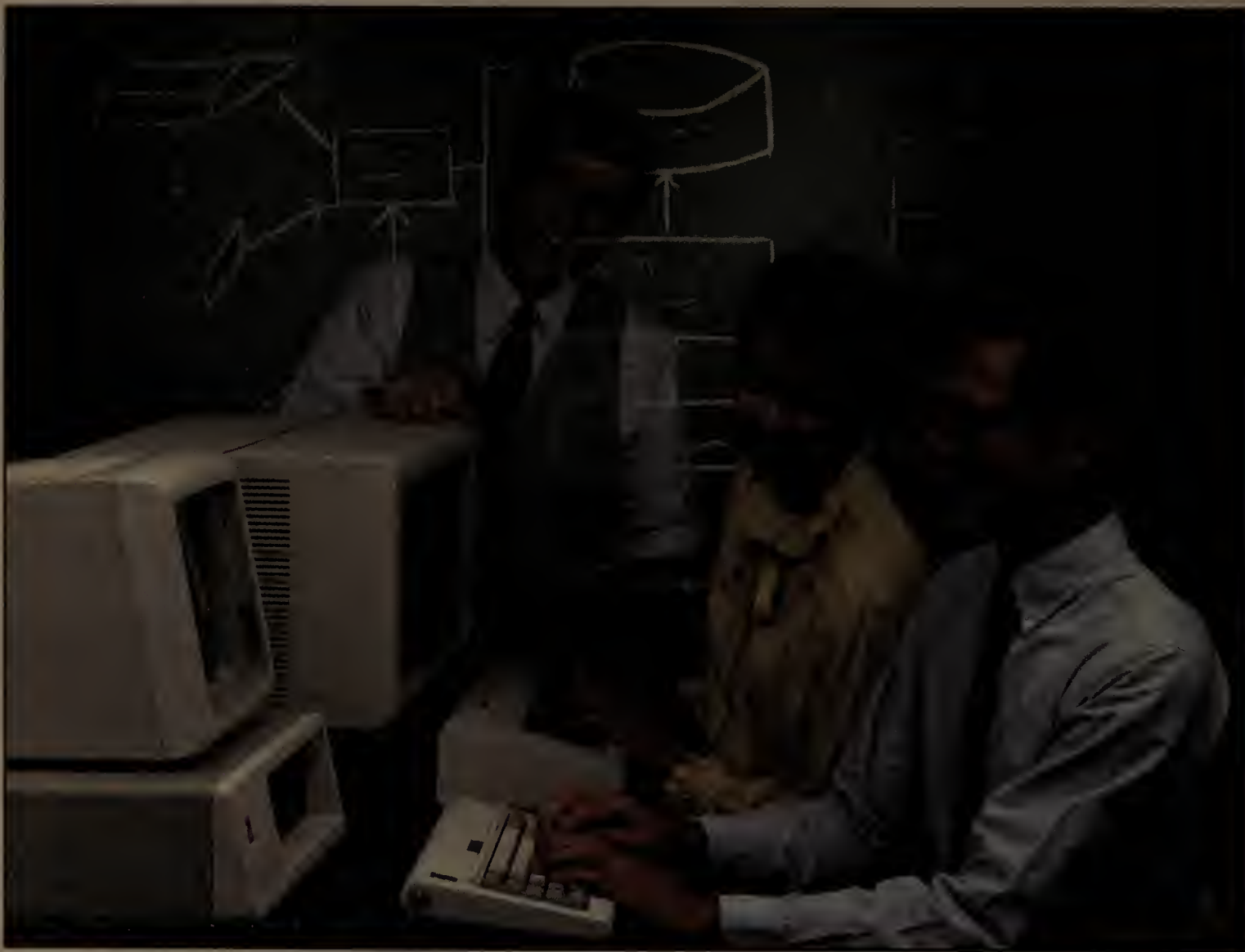
Individual users may now subscribe to Envoy 100 at lower rates than the service previously charged, TCTS said. Rates for the new service feature have been filed with the various regulatory bodies of member companies, and approval is expected in September.

Another new development reportedly links Canadian subscribers to more than 55,000 TWX autodelivery stations throughout the U.S. The service also now uses a subaddressing system to send messages to autodelivery terminals clustered behind a concentrator.

The rates for the individual user service include an initial \$25 fee and fixed monthly charges of \$5 plus actual use. The autodelivery service to the U.S. is available for additional charges of \$1 for the first minute and 10 cents for each additional six seconds.

Transcanada Telephone System can be reached at Room 1150, 160 Elgin St., Ottawa, Ontario, K1G 3J4.

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Standardization of Terminals Needed Science of Interconnection Experiencing Growth

By J.M. Dubois
Special to CW†

The connection of computers from different vendors, to constitute what is fittingly called heterogeneous networks, is a fairly recent phenomenon. It is impossible, as yet, to analyze it in the manner of a placid historian.

But if one observes how, in practice, the research centers have resolved the problems of heterogeneous connections, from batch systems to on-line systems, one ascertains a continuity of efforts that results in the International Standards Organization (ISO) pondering the global problems of standardization of terminals and protocols.

The development of local networks, the increasing role of public networks and increasing user demands have made it impossible for manufacturers to develop independently from the movement to standardization. Therefore, the big computer firms, with IBM in the lead, are reorienting their strategies to become, before all, telecommunications companies.

In varying degrees, all the manufacturers are offering connectability with other computers, largely because it is impossible to ignore the universal market share of IBM. Each manufacturer has a sphere in which it strives to specialize. IBM, however, is the only large manufacturer capa-

This article originally appeared in Computerworld's French sister publication, Le Monde Informatique, and appears here as part of the CW International News Network.

ble of offering a homogeneous range of products covering the majority of the industry's needs.

The other manufacturers, therefore, are taking two complementary steps. The first is to offer, within the architecture of the proposed network, the capability to connect to IBM computers; this is aimed at businesses that buy a maximum of equipment from this manufacturer rather than from IBM. Needs not met by this manufacturer are then met by IBM machines integrated into the network.

The other step, that of the other manufacturers striving to be the best in a narrow field, aims at offering the capability to connect non-IBM equipment to an IBM-dominated network. It therefore means offering a kind of complement where the IBM range does not meet the client's needs.

It is interesting to note that the two approaches are not exclusive of each other. Some suppliers think they can find themselves in either situation when facing a potential client — offering a complement to IBM equipment or offering their own equipment with IBM machines mak-

ing the necessary complement.

In addition, in spite of the tremendous growth of processing power in the recent past, processors are only a small part of the budget of the data processing centers. This evolution, which is reminiscent of the evolution that brought about the compatible peripherals a few years ago, is today a powerful drive for the development of the "connecting equipment science."

This is the second chance for manufacturers whose survival was guaranteed until now only to the extent that they were capable of responding to IBM's price changes. Up to now, the game was to offer almost the same thing for a similar price.

Distributed processing offers original solutions using data already entered in other computers, made possible by an interconnection between the heterogeneous equipment. In its most advanced present form, the connecting equipment science also provides, on a single network of lines and terminals, a host of services supported by different machines, which already presents obvious financial advantages.

Current developments in connecting equipment provide hope that one day the uniformity of data within a business will be guaranteed. With some help from the economic crisis, this is one of the areas where the user's needs precede what the manufacturers have to offer.

From the day when manufacturers set up their architectures, the complexity and disparity of protocols made the task of connecting an uncertain activity. The simple file transfers that many large-scale structures were able to constitute failed unless they were limited by archaic and sometimes obsolete communications methods.

As for connecting a multistation microcomputer to a heterogeneous network, several large-scale structures were led to define their own standards, to develop the corresponding software in the communications control units and host computers and sometimes even develop tailored terminals to satisfy a request for access from different manufacturers.

This may seem unbelievable. However, it must be obvious that the only universal terminal is the teletypewriter (TTY) or display keyboard — line-to-line terminal without transmission security — that no one wants today.

This situation is very critical.
(Continued on Page 126)

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'Connecting Equipment Science' on the Rise

(Continued from Page 124)
Manufacturers realized that incompatibility would protect their installed base. Today, they are quickly moving away from this initial position; to be incompatible is also to be prohibited from being inserted into an installation already equipped with terminals responding to another network standard.

The distribution of intelligence is now fashionable. Manufacturers of microprocessors have strongly aided this movement by permitting the integration of very complicated functions into the terminals.

The dialogue between two machines is governed by the one with the less rich vocabulary. The TTY offers the immense advantage of a universal dialogue because its dialogue is reduced to the minimum. At this point of disparity, manufacturers and users felt the need for a common reflection.

This was the beginning of the great venture of the ISO's standard Open Systems Interconnection (OSI). This effort for beneficial standardization has still not been carried through. But from now on, it provides an understanding of the functionalities of a network and the application field of the standardization.

The structure in the seven layers of the OSI model is not sufficient to define a network. Between two pieces of network equipment, any layer can talk with a layer of the same level via the lower level layers. Within the same piece of equipment, the dialogue between layers of a

different level is free. On the contrary, between two pieces of network equipment, there is a protocol particular to each layer which must be strictly respected.

The seven layers are present in the peripheral nodes of the transport network — in the assembly made of the computer and the transmission control unit that connects it to this network as well as in that which makes up the cluster control unit and the terminals.

Three Layers Included

All the nodes of a meshed network include the layers one, two and three that permit them to receive the rasters, free them into packages and reconstitute them into a raster intended for one of the other lines that they handle.

The benefits of making the networks public can never be overstated. It forces the manufacturers to support identical standards for the first three layers. However, layer four still differs from one manufacturer to another. As a compensation, some manufacturers made layer three accessible from the host computer. In this case, it is possible to program inexpensively file transfer applications.

For these applications, only layer four has a real importance with regard to the volume of developments to be made. Layers five and six are reduced to the simplest expression.

If a user is determined to have a single terminal by virtual circuit and one of the simplest types of terminal support, it is also possible to

make up a network of heterogeneous computers where any terminal talks to any application.

Public networks will probably have increasing importance in the coming years. The standardization of OSI layer four is on the verge of materializing. Without OSI standards, some networks already offer more complex services.

For example, it is possible to be connected to a net with a terminal including a given protocol and to connect it to a computer like another type of equipment. If it is open, the virtual equipment protocol allows the connection of a computer with a very concise connection software.

The expansion of public networks offering attractive rates is a phenomenon that no manufacturer can ignore. The higher the level of services offered, the simpler the software allowing the connection to these networks will be.

In addition, these services tend to overrun the framework of data transport. Making available the power of processing and opening the data bases to users seems to be the natural evolution of what is currently called value-added networks.

Most Important Event

This collusion between the interests of computer manufacturers and those of suppliers and users of telecommunications networks is probably the most important event in the last few years of data processing.

With aggressiveness from computer manufacturers, the major public networks are themselves confronted with dangerous competition. A growing number of local networks offer a remote connection capability. The principle is simple — a telecommunications adapter is introduced into a local network.

Two local networks equipped with this kind of adapter linked by a high-speed line are seen as a single network by their users. This solution gives public networks a formidable competitor in any business where the terminals are distributed geographically by clusters in areas no larger than a few kilometers.

With regard to the connecting equipment, the local network offers the same advantages as the public network. In addition, it offers the considerable advantage of reducing the enormous wiring work and its corresponding costs. The essential drawback of this type of connecting equipment is that it is also aimed at satisfying of-

fice data processing needs.

According to the aspect on which they focus and the techniques they use, suppliers of local networks build even more diversified standards than those of the architectures of data networks.

Architectures of computer networks, public networks and local networks are currently engaged in a formidable battle. At stake in this battle is the establishment of two groups of standards:

- The functions of different types of terminals.
- The exchange protocols between these terminals and

an application.

The importance of the interests at play in this confrontation is without precedent. It is a question of simultaneously dominating the computer market as well as the terminal and telecommunications equipment markets and of tapping the growth of income generated by the DP-based communications.

Who will win this confrontation? It would be the users, if they know how to take control of the process of defining standards that are intended for them.

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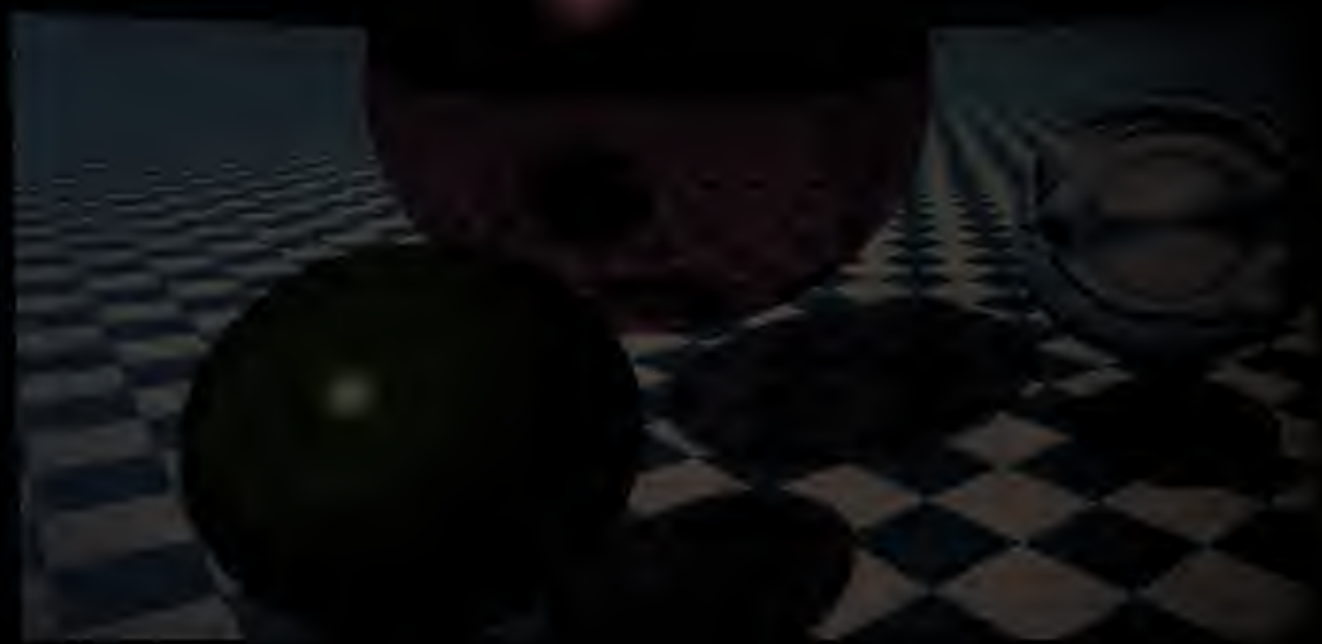
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Applications Package Also Unveiled

Gould Disk Controller Boosts Concept/32

By Tom Henkel
CW Staff

FORT LAUDERDALE, Fla. — Gould, Inc.'s SEL Computer Systems Division last week unveiled a disk controller with cache memory and a Unix-based applications development package. Both products were developed to improve the performance of the division's Concept/32 line of supermini-computers.

The company also introduced a system that teaches programmers how to use the Ada programming language (see box).

The Cache Disc Accelerator introduced last week for the Concept/32 is a disk controller for one integrated disk drive and up to seven external disk drives. Each unit provides 2M- to 16M bytes of cache memory, which Gould said can boost the superminis' performance three-fold for I/O-intensive users.

The accelerator also provides the capability of writing the same information to two disks simultaneously, according to Gould product manager Bill

Boyd. Typical users of the accelerator would include those running transactional systems with a large number of interactive terminals, large data base applications, computer-aided design, image processing and telepro-

cessing.

During write operations, the Cache Disc Accelerator transfers large blocks of data from main memory to cache memory in the disk controller. Since write operations are considered

complete as soon as data is received by the cache, the CPU is not tied up waiting for information to be physically written onto a disk, a Gould spokesman explained.

The cache memory is also said to improve performance during read operations, Gould claimed. According to Boyd, large programs and data files can be kept in cache memory where they can be accessed much faster than from a disk.

Battery Backup

The Cache Disc Accelerator is equipped with battery backup that can keep the unit operational for approximately one hour after a power failure. Additional battery backup can extend the stand-alone functionality to two hours.

In addition, the unit is equipped with self-diagnostics, dynamic save, error detection and correction, graceful shutdown in a cache failure and multiport capabilities, Boyd said.

The Cache Disc Accelerator can function in place of — but does not eliminate — current disk controllers available from Gould, he added.

Available in December, an entry-level Cache Disc Accelerator subsystem including a controller with 2M bytes of cache

(Continued on Page 132)

System Designed to Teach Ada to Programmers

By Tom Henkel
CW Staff

FORT LAUDERDALE, Fla.

— In an apparent gesture of support for its government and military user base, Gould, Inc.'s SEL Computer Systems Division last week announced a computer system designed to teach programmers how to use the Ada programming language, developed by the U.S. Department of Defense (DOD).

Based on Gould SEL's Concept/32 line of superminicomputers, the Ada

Learning Environment (ALE) system uses UTX, Gould's version of Unix, and ICSC-Ada, Irvine Computer Sciences Corp.'s Ada translator.

The minimum system requirements for ICSC-Ada are a processor with a minimum of 1M byte of main memory, at least 80M bytes of disk storage, a magnetic tape drive, a line printer, terminals, a variable number of eight-line asynchronous controllers and a Gould operat-

(Continued on Page 132)

Processor Board Added to IBM Micros

ROLLING HILLS ESTATES, Calif. — Ryan-McFarland, Inc. has announced a processor board that can turn an IBM Personal Computer or Personal Computer XT microcomputer into a multiuser Cobol-oriented processor.

Manufactured by Sritek, Inc., the board is based on a Motorola, Inc. 68000 microprocessor and supports Ryan-McFarland's commercial operating system RM/COS. The board can perform address relocation and

memory protection.

In addition, the board reportedly increases system throughput by using the 68000 for central processing and the already built-in Intel Corp. 8088 microprocessor as an I/O processor, the vendor said.

The 68000-based card is available in 8- or 10-MHz versions. With the RM/COS operating system and 256K bytes of main memory, the unit costs \$2,495.

With an additional 256K

bytes of main memory, the unit costs \$2,995, Sritek said from 609 Deep Valley Drive, Rolling Hills Estates, Calif. 90274.

Advanced Technology Brings Micros to CAD

By James Dunn

Special to CW

Less than 24 months ago, it was not possible to buy a micro-

computer-based, computer-aided design (CAD) system. Today, there are several high-quality, very powerful, fully integrated turnkey systems. One such system features three-dimensional graphics with 256-color capability for under \$50,000.

To get this kind of performance on a CAD system running on a minicomputer would cost up to \$150,000.

It is not just the high-end micro systems that are impressive. There are systems on the market that provide high-quality, two-dimensional monochrome graphics running on smaller computers like the Apple Computer, Inc. Apple II for about \$10,000.

One of the primary reasons running CAD on microcomputers became a reality was the explosive increase in microcomputer processing power. Termed "supermicros," 16- and 32-bit micros now have the processing power of minicomputers. Even 8-bit systems have speed-up, microprocessor-based, add-in boards that allow them to operate effectively at 16-bit levels.

Without these technical innovations, micros could not

(Continued on Page 134)

Improved Tape Drive Capabilities Streamline Paper's Operations

SANTA ANA, Calif. — The addition of improved tape drive capabilities at a metropolitan

newspaper has reduced information processing delays, cut costs and increased storage capacity.

The Register, the Santa Ana-based flagship of Freedom Newspapers, Inc., has found the use of computer systems has streamlined its operations, important in a business where fast-breaking news stories and heated deadlines leave no room for data processing errors.

An important part of its computer operations is the set of functions handled by tape drives. The drives provide the means to store data on tapes and to control its movement on disks (or systems) to and from those tapes. Tape drives also provide data storage and security capabilities. Their speed, density, read/write and loading

operations can make or break the efficiency of the entire computer system.

However, tape performance problems, including slow speed, loading difficulties and excessive errors in read/write functions, were causing delays with the newspaper's data processing. Insufficient tape drive performance forced increases in operator time and computer usage leading to additional operating expenses, according to Bob Mahoney, DP manager at The Register.

There are five computers serving The Register. The largest data base monitors the circulation and financial departments and is controlled by two high-performance Hewlett-Packard Co. HP 3000 computer systems

(Continued on Page 138)



The Model 3311 Tape Drive

Gould Unwraps Ada Learning Environment

(Continued from Page 131)

ing system.

The translator was designed to operate with a C compiler to provide a subset of Ada language capabilities under UTX.

The translator accepts the Ada source code and translates it into the C programming language. The C language is then input into the C compiler to produce an executable image, according to Gould.

The process is transparent to the user, and all programs developed using the ICSC-Ada translator will be upward-compatible with DOD-validated Ada compilers, Gould said.

The ALE system is available in three packages, each using a different Gould Concept processor:

- The Model 1815-3 ALE is an entry-level packaged system consisting of a Concept 32/27 processor with 2M bytes of main memory and eight alphanumeric CRT terminals. The purchase price of the system is \$129,000.
- A mid-range ALE system, the Model 1815-5, includes the Concept 32/6705 processor with 2M bytes of main memory and 16 alphanumeric terminals. It costs \$215,000.
- The top-of-the-line Model 1815-7 features the Concept/8750 processor with 3M bytes of main memory and 32 alphanumeric terminals. It costs \$366,000.

Included with each packaged system is the UTX operating system, the ICSC-Ada translator, on-site training, installation and documentation, according to Bob Bergman, Gould SEL's director of Unix marketing and planning.

Gould is also offering a 10-month lease program for the ALE that al-

lows government organizations to use the equipment before it becomes a capital expense and requires a request for bids, Bergman said. The lease program allows agencies to either eliminate or replace the system if Ada requirements should change.

The Model 1815-3 ALE package leases for \$9,716/mo including maintenance, the mid-range Model 1815-5 for \$16,526/mo and the high-end Model 1815-7 for \$27,846/mo. A portion of the monthly lease rate can be applied to purchasing the system, according to Brian Garnichaud, Gould SEL's software product manager.

In addition, a special multiple-unit purchase discount of 5% is available on all purchases of two or more identical ALE hardware/software packages. Gould SEL is also offering the Ada translator software alone for \$30,000.

Gould SEL can be reached at 6901 W. Sunrise Blvd., P.O. Box 9148, Fort Lauderdale, Fla. 33310.

Disk Controller, Package Boost Concept/32 Series

(Continued from Page 131)

memory and an 80M-byte moving-head disk drive costs \$77,000. Additional cache memory costs \$8,925 per 1M byte.

The Unix-based applications development package announced last week was developed for users running the Concept/32 superminis in the MPX-32 operating environment. Known as the Multi-Target Executive (MTX), the package allows applications developers to create Fortran 77+ programs in a Unix operating environment and then transfer those programs to operate under MPX-32.

MTX includes UTX, Gould's version of Unix; MPX-32; and ACX-32, an X.25-based local-area network. At the heart of the MTX package is a Fortran 77+ cross-compiler that allows Fortran programs to be compiled on a host processor and executed on another processor running MPX-32.

Downloading of the object program from the host to the target processor is accomplished via an X.25 protocol, according to Gould's software product manager Brian Garnichaud.

The software was designed to run on two interconnected Gould Concept/32 processors, one running UTX, the other running under MPX-32. Communications between the two systems is handled by a Synchronous Communication Multiplexer, ACX-32 and a virtual circuit protocol, Garnichaud said.

MTX currently supports only Fortran 77+ and the MPX-32 operating system. Gould is planning to add more languages, such as the Department of Defense's Ada, and other operating systems, such as Digital Equipment Corp.'s VMS, as options to the package. Garnichaud did not say when those options would be available.

The cost of MTX is based on the number of terminals tied into the system. For example, the software costs \$5,500 for a system with one to eight terminals. It costs \$7,500 for a system with nine to 16 terminals. The Fortran 77+ cross-compiler costs \$5,000.

Gould's SEL Computer Systems Division is located at 6901 Sunrise Blvd., Fort Lauderdale, Fla. 33310.

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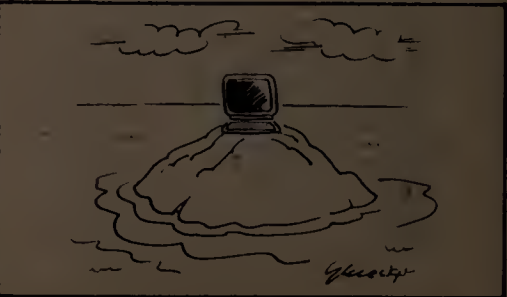
Bar Code Readers Available For Micros

BOHEMIA, N.Y. — Bi-Tech Enterprises, Inc. has announced the availability of bar code readers for Radio Shack's TRS-80 Model 100 and Epson America, Inc.'s HX-20 portable computers.

The bar code reader reportedly allows the user to read industry-standard code and store the results in the computer's memory. The reader features a push-to-read switch and a scanner rate of up to 76 cm/sec and will read lines as small as .3 mm.

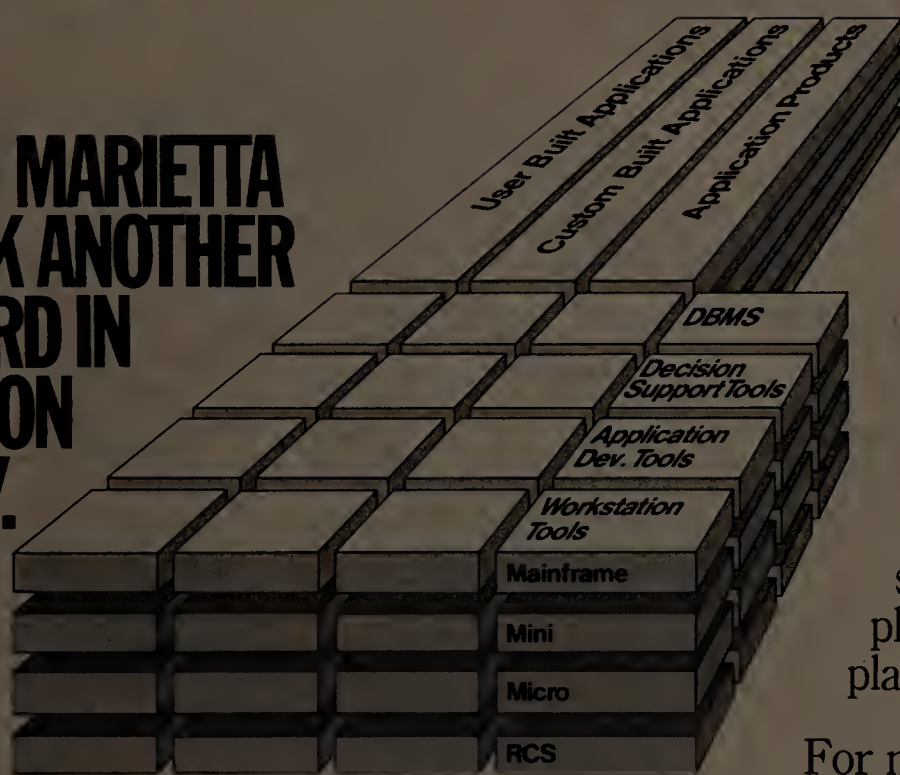
The unit comes complete with software and bar code reader and retails for \$279.95.

Bi-Tech Enterprises is located at 10B Calough Road, Bohemia, N.Y. 11716.



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MARTIN MARIETTA

Greater Processing Power Brings Micros to CAD

(Continued from Page 131)

have handled the I/O-intensive load that a CAD program puts on a CPU. With stand-alone micros, each operator has a dedicated CPU that performs with even less degradation than a minicomputer system with three or four workstations.

The biggest problem facing micro-based CAD systems is dispelling the notion that microcomputers do not have the horsepower to run CAD programs effectively.

It is no longer a question of whether microcomputers have the capability or whether the software is of production quality. The question has become: In what ways are micro-CAD systems preferable to the larger mini and mainframe systems — be-

sides the obvious advantage of price?

An ideal market for these systems is the small to medium-size engineering and architectural firms with perhaps three designers and a couple of draftsmen. These users were already aware of the advantages of CAD, but with a capital investment of more than \$125,000, it just was not feasible.

The alternative for these shops was time-sharing, either through on-site remote workstations or at a local engineering service bureau. But with the explosive increase in microcomputer processor capability, the parallel decrease in cost and the availability of powerful micro-CAD software, stand-alone micro-CAD systems became a preferable alternative in both

price and performance.

A low-end CAD system for a smaller shop is particularly helpful in dealing with work load fluctuations. Prior to the availability of affordable CAD, a shop would typically hire additional drafting personnel when projects came in and then lay them off when the work was completed.

With CAD systems providing three to five times the productivity, it is possible for these shops to handle the increased work load in-house and maintain a continuous and stable work force.

Another viable market for low-end CAD systems are large corporations where the individual divisions are medium-size companies them-

selves. Within these divisions, an affordable CAD system can be of great help in a wide variety of applications.

Large companies usually purchase \$500,000 CAD/computer-aided engineering systems to assist in the design phase of a project. However, in the real world of design, at least 80% of the effort involves research and specification analysis, whereas 20% or less of the time is actually spent in drafting.

So for a half-million dollars, and after a three- to six-month learning curve, a tool is available that will improve a designer's productivity fivefold on only 20% of a project.

Cost-Effective Configuration

A far more cost-effective configuration is to put the designer on a micro-CAD system at a station cost of \$25 per hour and to link that station to the mainframe system, where station costs are \$80 per hour. This allows a designer time to design cost-effectively while the drafting people use the large CAD system to do high-production drafting.

Micro-CAD can be effectively integrated with existing large CAD systems. Realistically, however, high-end micro-CAD systems can compete head-to-head with many of the larger CAD systems. They will eventually replace them in many applications.

In 90% of the applications, large CAD systems are used for drafting only, not design. In this area, a high-quality micro-CAD system can do the job for a fraction of the cost.

With a mini or mainframe system, if the computer goes down, all the workstations go down. And a large system must pay for itself with extremely high productivity, so the problem of computer downtime becomes even more serious. In general, a series of stand-alone systems will provide better protection against downtime through redundancy.

The mainframe-CAD systems come from the batch-processing world. Even the most sophisticated mainframe systems utilize a remote job entry setup. This technology is archaic in view of the new technologies microcomputers have afforded.

Micro-CAD offers several advantages over the larger systems. Because of the proliferation of micros, there is a wealth of third-party software available and a host of talented programmers who will continue to develop more powerful software.

In addition, micro software is easily reproducible, providing economical software backup. Another plus for micro software is that it is inherently easier to use. Micros are used by a large cross section of people, the majority of whom are not sophisticated users, and the software design reflects this user base.

All things being equal, it will be the companies with the greatest hands-on design expertise that will succeed in the micro-CAD market. This hands-on experience allows them to better integrate the systems into vertical markets and to train users more effectively to solve problems specific to their industry.

Dunn is president of Ditechs Corp. in Walnut Creek, Calif.

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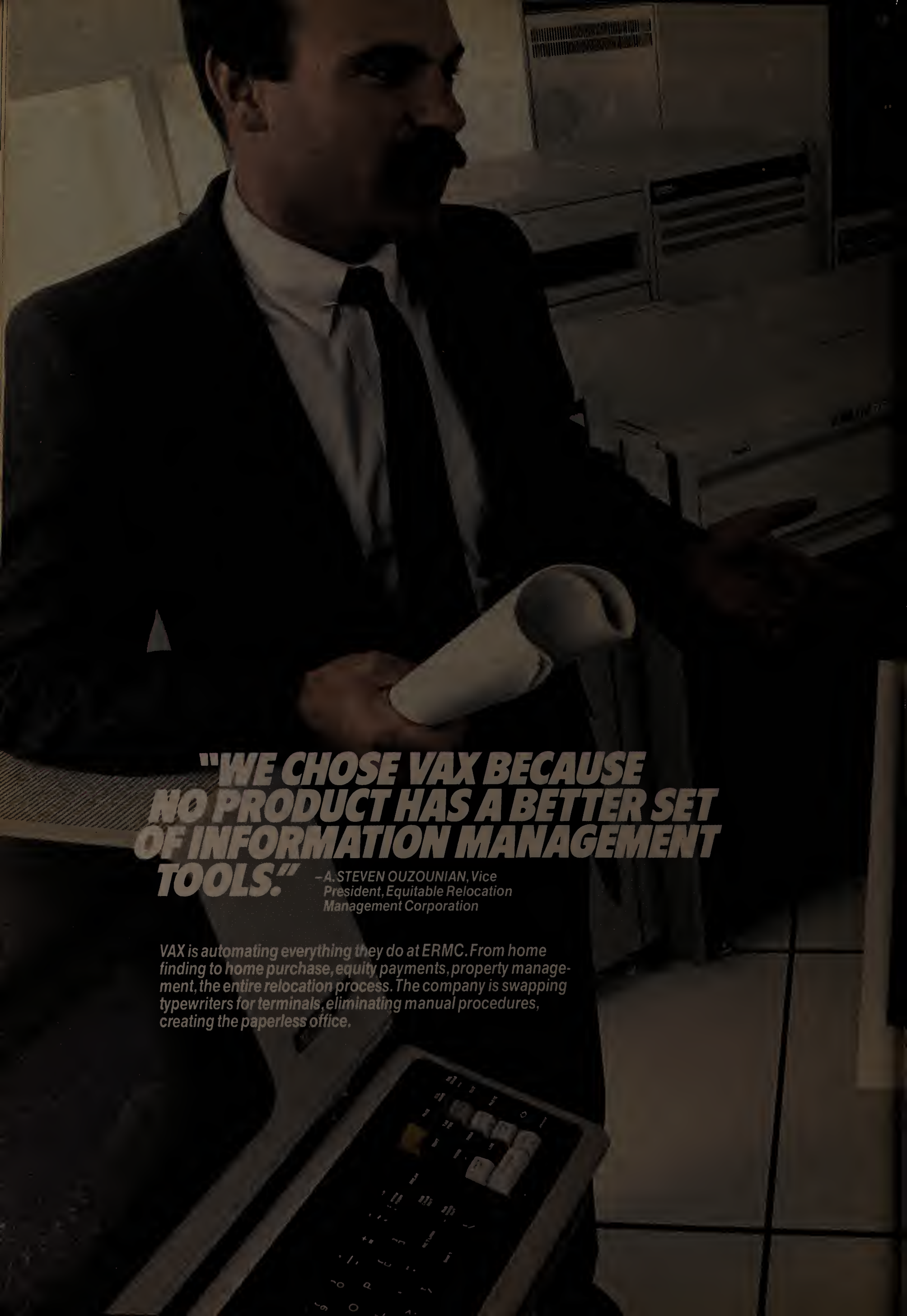
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Photographed at IBM Data Center, Chicago, IL

A man in a dark suit, white shirt, and dark tie is shown from the chest up, holding a rolled-up document. He is looking towards the right. The background is a dimly lit office with a desk and some equipment.

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digital

Tape Drive Reduces Processing Delays for Paper

(Continued from Page 131)

— Systems 1 and 2. Combined storage capacity is 1,604M bytes. Each HP 3000 computer is supported by one HP 7970 tape drive.

System 1 controls total market coverage programs and all records for the newspaper's 307,000 circulation. The financial System 2 runs the general ledger, payroll, order entry, accounts payable and accounts receivable.

The HP 7970 drives operated at 800 or 1,600 bit/in., which Mahoney said was both too slow for the paper's applications and too slow to take full advantage of the 3000's higher performance capabilities.

In addition, at 1,600 bit/in., the paper filled 18 reels of tape each time

the system was fully backed-up, causing problems with tape storage.

Additional difficulties in read/write and backup contributed to problems in tape drive performance. The tape drives could not efficiently advance over tape flaws, causing the operator to stop the unit, unload and reload the tape. The Register's DP department realized that in order to reduce processing delays and smooth out computer operations, the tape drive capabilities had to be improved.

Selecting a Tape Drive

After evaluating several tape drives, including those from HP, the newspaper selected the Model 3311 from Qualex Technology, Inc. The

Qualex drive, which was installed in October 1982, has enabled the DP department to take full advantage of the two HP systems.

One Qualex drive replaced both HP 7970s and is shared by both CPUs through a Qualex electronic tape sharing switch. "Shared Mass Archive Storage Host eliminated the expense of maintaining separate drives for each CPU," Mahoney said.

The newspaper conducts a partial backup of both Systems 1 and 2 daily with a full backup weekly.

"With the Qualex drive, we're able to back up the entire data base on 3½ reels compared with the 18 reels previously needed with the HP units," Mahoney said. "We've significantly reduced expenses for additional

tapes and have more control on storage."

Also, the Qualex drive is fully self-loading and is engineered to advance quickly over tape errors without disrupting read/write or backup performance.

Minimal read/write errors, faster access and backup and ease in loading and unloading tapes has afforded The Register higher efficiency in its data processing operations. "We're confident that Qualex will continue to meet our data processing needs," Mahoney said.

Fujitsu Unveils Thermal Printers

LAKE BLUFF, Ill. — Fujitsu America Ltd. has announced 20- and 40-col. thermal printers, called the FTP-020 and FTP-040.

Both units feature fixed-head printing and virtually noiseless and maintenance-free operation, the vendor said.

The FTP-020 features a dot density of 140 dots and a print density of two lines of 20 characters each. The unit is equipped with a 5 by 7 dot matrix and can print 45 or 90 char./sec, the vendor claimed.

The FTP-040 has a 280-dot density and a print density of 4-in. lines of 40 characters each. The unit has a 5 by 7 dot matrix and reportedly can print at 90 char./sec.

The FTP-020 costs \$160, and the FTP-040 costs \$200. OEM discounts are available. Fujitsu America is located at 918 Sherwood Drive, Lake Bluff, Ill. 60044.

Pricing Review On Micros Out From IDC

FRAMINGHAM, Mass. — International Data Corp. (IDC) has introduced what it is billing as the industry's first comprehensive microcomputer pricing review that describes over 300 products and their prices.

Titled "Microsystems Competitive Review," the study examines the scope of the leading vendors in the marketplace and the pricing dynamics of their various products in assorted configurations, a spokesman said.

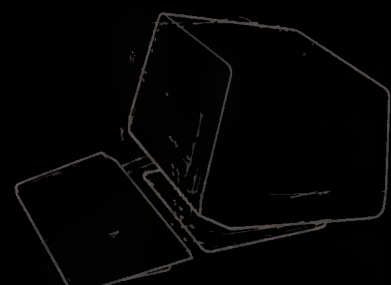
Referring to the study, an IDC senior analyst said, "it is the combined effort from the full range of companies that shapes the market. In fact, much of the product and pricing innovation comes from virtually unknown start-ups."

The review was intended as a product planning tool for vendors, resellers and users who want to keep up to date on the latest trends in the microcomputer marketplace.

The report was written as part of IDC's Guide series and is being offered in a two-edition format priced at \$395. Additional copies are available for \$125.

More information about the report is available from IDC, 5 Speen St., Framingham, Mass. 01701.

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For memory, the enclosure is constructed from lightweight plastic and can easily be moved to a convenient maximum operation position. A detachable keyboard, with a large 7x9 dot matrix character set and a numeric keypad, is one of the many human engineering features that make this unit on much higher priced terminals.

Another distinctive feature of the VISUAL 50 and VISUAL 55 is their emulation capability. Both terminals are 100% compatible with the Hazeltine Esprit, ADDS Viewpoint, Lear Siegler ADM-3A and DEC VT-52. In addition, the VISUAL 55 offers emulations of the Hazeltine 1600 and VISUAL 210. Most driven set-up modes in non-volatile memory allow easy adjustment of terminal parameters.

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Detachable Keyboard	YES		YES		
N-Key Rollover	YES		YES		
Audible Key Click	YES	YES			
Menu Set-Up Mode	YES				
Status Line	YES				
Full 5 Attribute Selection	YES				YES
Smooth Scroll	YES				
Line Drawing Character Set	YES				
Block Mode	YES	YES			YES
Insert/Delete Line	YES	YES			YES
Bi-Directional Aux Port	YES	YES		YES	
Columnar Tabbing	YES	YES			YES
Independent RCV/TX Rates	YES				
Answerback User Programmable	YES				

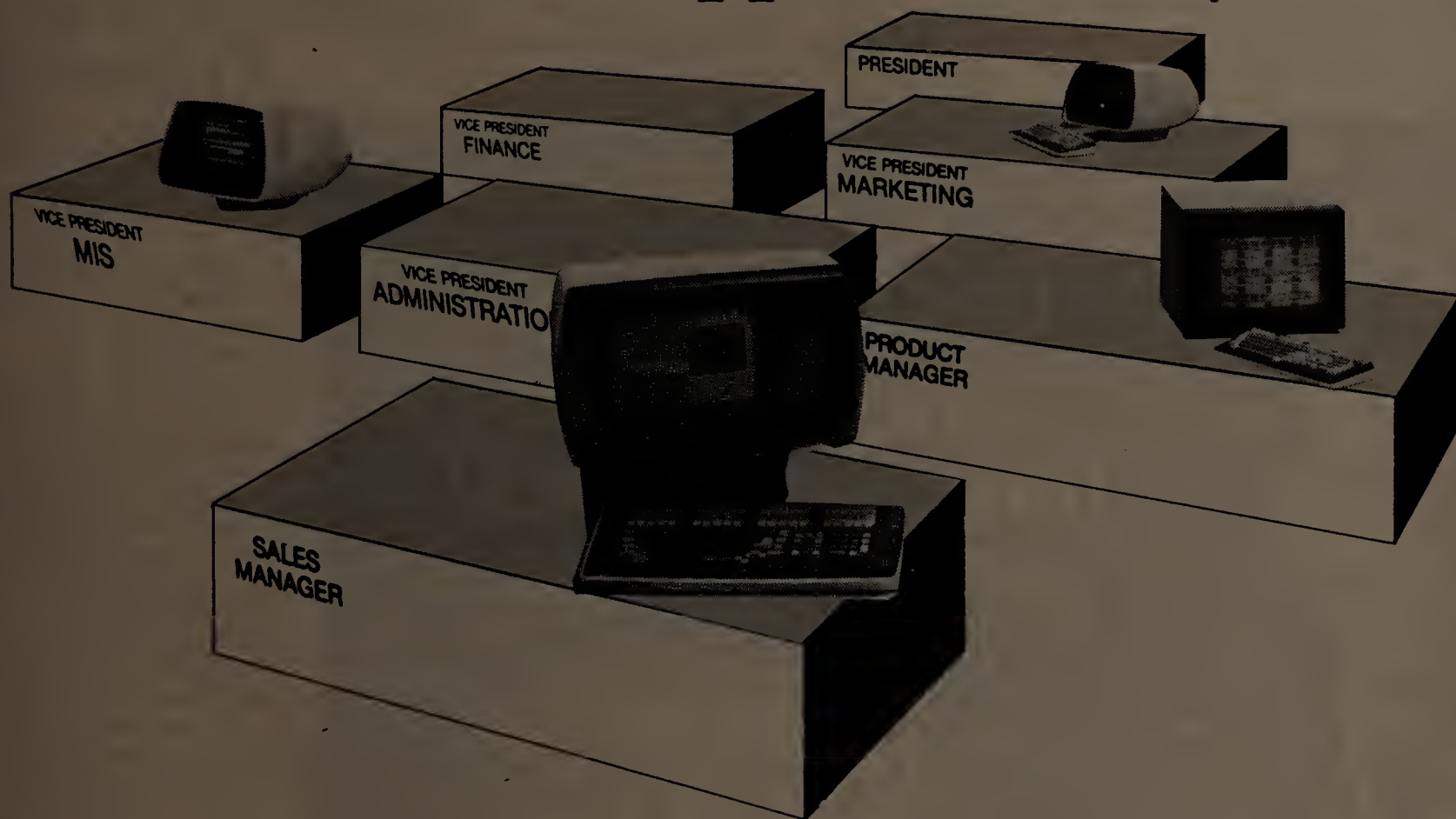
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And there'll be a special profile of an operating information center where employees are trained on the use of personal computers. You'll see how they're helped in selecting the right product for their needs and how they're aided in implementation and ongoing training. You'll also get a look at the financial ins and outs of the market, pros and cons of personal computers replacing CRTs, and . . . you get the idea. You're going to get a whole issue packed with news on micros you can't afford to miss.

And if you sell micros and micro products, you shouldn't miss this opportunity of having your product represented in this *Computerworld Extra!* issue that will be saved and used as a reference. The deadline for ads is October 21. To get your space reserved, call Don Fagan, Vice President Sales/Marketing at (617) 879-0700 or call your local *Computerworld* sales office, listed below.

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Mostek Controller Board Compatible With VMEbus

CARROLLTON, Texas — Mostek Corp. has announced a single-card systems controller board compatible with the VMEbus. The VMEbus specifications were jointly developed by Mostek, Motorola, Inc. and Signetics Corp.

Called the VME-Syscon, the unit performs all the slot-1 board functions required by the VMEbus and complements the existing Mostek VMEbus systems family, the vendor said.

Slot-1 board functions provided by the unit include: a 16-MHz system clock; ac failure indication; and power up/down reset with an on-board, push-button reset and remote reset

input. Also included is a choice between four-level priority and four-level round-robin arbitration.

The board is warranted for one year and costs \$980, the vendor said, from 1215 W. Crosby Road, Carrollton, Texas 75006.

HP 9845B Desktop Gets MSROM

MOUNT HOLLY, N.J. — Structured Software Systems, Inc. has announced a plug-in mass storage read-only memory (MSROM) board for Hewlett-Packard Co. HP 9845B desktop computers.

The MSROM reportedly allows the HP 9845B/C computers to use the

Display Stations Enhanced

CUPERTINO, Calif. — Memorex Corp. has enhanced both its 2078, which is plug-compatible with IBM's 3270 terminals, and its 2051 display station, which can be hooked up to IBM System/34, System/36 and System/38 terminals with amber phosphor screens and ergonomically-styled keyboards.

Customers can order the amber

screen for the same price as the standard phosphor screen, a spokesman said. The company contends many users prefer amber screens to any other because amber retains better contrast and clarity of characters.

Shipments of the ergonomic keyboards are scheduled for October. The keyboard will be available as an option for both the 2078 and 2079 color display station which is also plug-compatible with IBM's 3270 series. Cost of the unit ranges between \$600 and \$900, depending on features and options.

Further information on the two enhancements can be obtained from Memorex at San Tomas at Central Expwy., Santa Clara, Calif. 95052.

Package Links Micropro Tool To Cromemco

MOUNTAIN VIEW, Calif. — A package bundling Cromemco, Inc.'s personal computer with Micropro International Corp. software has been announced by Cromemco.

The system, designated C-10MP, includes Cromemco's C-10 personal computer and Micropro's Wordstar, Infostar, Calcstar and Mailmerge programs. Also included are several of Cromemco's own programs, including Planmaster, Moneymaster and Writemaster.

The C-10 was announced in June 1982, and includes a double-density disk drive with 390K bytes of memory. It runs on Cromemco's own Cdos operating system. Cromemco said it has developed special menus for each of the Micropro programs.

Suggested retail price for the bundled system is \$2,195. Further information is available from Cromemco through P.O. Box 7400, 280 Bernardo Ave., Mountain View, Calif. 94039.

Data Switch Allows Transfer In RS-232C Net

WATERTOWN, Mass. — Digital Laboratories, Inc. has introduced a software-controlled data switch said to allow the transfer of data anywhere in a network of eight RS-232C, current loop and transistor-to-transistor devices.

The Digital Micro Matrix II provides 64 memory-mapped connection points. The setup is simplified by firmware that includes prompts, a command menu, connection displays and handles ports by user name.

Offered as a single-board micro-computer or as a complete package with network handler, power supply and enclosure, the Micro Matrix II incorporates 1K byte of random-access memory and nonvolatile storage for 16 different switching arrangements. All 64 connection changes reportedly occur within 7 usec.

The Digital Micro Matrix II is priced at \$795 for a single-board configuration and \$995 for the complete enclosure from Digital Laboratories, located at 600 Pleasant St., Watertown, Mass. 02172.

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For International Use Control Console Checks Surges

BETHLEHEM, Pa. — Kalglo Electronics Co., Inc. has announced an international-model computer power-control console said to offer surge suppression and a power line noise filter to help eliminate equipment failures, glitches, lost programs and downtime in the overseas environment.

The portable International

Power Console Model reportedly can be connected to any power system in the world via the use of IEC-320/CEE-22 connectors for I/O. With the console and locally purchased matching cordsets, the user can connect up to six pieces of computer equipment to conditioned and filtered power.

The unit provides six indi-

vidually switched IEC-320/CEE-22 outlets in dual, separately filtered banks of three each. Noise filtering is in five stages with both differential and common-mode attenuation, providing up to 52 db insertion loss at 10 MHz. Surge protection is accomplished in six stages with both differential and common-mode protection. The unit has an energy absorption capacity of 318 Joules at 18,200A pulse. A main input IEC-320/CEE-22 international standard connector is provided to monitor the differential and common-mode protection status. The unit is rated for 10A maximum with 100 Vac to 260 Vac operation, 50Hz or 60Hz and thus can be used virtually anywhere in the world, the vendor said.

Suggested retail is \$150 from Kalglo Electronics Co., located at Colony Drive Industrial Park, 6584 Ruch Road, E. Allen Township, Bethlehem, Pa. 18017.

Wang Offers Conditioner, System Protector

LOWELL, Mass. — Wang Laboratories, Inc. has introduced a power conditioner and a system protector designed to protect computer hardware against costly damage, downtime and loss of data caused by electrical power problems.

The Purepower Conditioner and Purepower System Protector product lines are said to include six devices to help shield Wang hardware from lightning-induced electrical spikes and other power problems.

The Purepower Conditioners reportedly are engineered to provide regulation, isolation and buffering of voltage and frequency dis-

turbances and also help to supplement dedicated lines, thereby suppressing ac power line problems. Offered in a variety of sizes to meet system requirements, Purepower Conditioners range in price from \$400 to \$3,100.

Purepower System Protectors come in single-phase and split-phase models that help shield Wang hardware from massive spikes, nearby lightning strikes, electromagnetic or radio-frequency interference and other electrical impulses. These models cost \$150 for single-phase and \$375 for split-phase. Wang Laboratories is located at 1 Industrial Ave., Lowell, Mass. 01851.

Radio Shack Printer Ties to MC-10 Micro

FORT WORTH, Texas — Radio Shack has unwrapped a 30 char./sec thermal printer that can be connected to the company's Micro Color Computer Model MC-10 through built-in 600 bit/sec serial interface.

Dubbed the TP-10 Thermal Printer, the unit prints 95 Ascii characters plus 16 block-graphics characters that are compatible with screen graphics produced by the MC-10.

The thermal device prints up to 32 char./line and features an elongation mode for expanded print and a special repeat function to make graphics programming easier, the company said.

The 3-, by 8-, by 5-in. device weighs a little over three lbs and is available through Radio Shack Computer Centers, the company said, from 1800 One Tandy Center, Fort Worth, Texas 76102.

Cache MP/M Offered

CLEVELAND — QDP Computer Systems has added cache memory to two configurations for Digital Research, Inc.'s MP/M operating system in its 100 and 300 series of microcomputers.

The cache MP/M system automatically provides a large data buffer between the hard or floppy disk drives and the CPU. It keeps large data blocks in the cache memory for quick access by up to four users of an MP/M-

based system.

Options for the QDP MP/M system include a 256K-byte random-access memory (RAM) board and the cache memory at a suggested retail price of \$1,295. A larger, 512K-byte RAM board is priced at \$1,825. The QDP-300 four-user, dual-floppy disk system begins at a suggested retail price of \$4,695 from QDP at 10330 Breckville Road, Cleveland, Ohio 44141.

K-Clock Supports Kaypro II, IV Micros

SALT LAKE CITY, Utah — Holmes Engineering, Inc. has unveiled the K-Clock, a battery-operated real-time clock/calendar for Nonlinear Systems, Inc.'s Kaypro II and IV microcomputers.

The K-Clock reportedly eliminates the need to reenter constantly the time and date. Applications include real-time monitoring and recording of time, date and day in a

process-control environment. It plugs directly into a socket inside the Kaypro II or IV.

Included with the K-Clock is a 5¼-in. diskette that contains routines for setting the clock/calendar and displaying time/date.

The K-Clock costs \$99.50 plus \$5 for shipping. Holmes Engineering is at 5175 Green Pine Drive, Salt Lake City, Utah 84107.



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Study Identifies CWP Buying Strategy

By Jim Bartimo
CW Staff

NORWALK, Conn. — Five years of chaotic introductions of personal computers and word processors in the corporate world has taken its toll, and top management in the 3,000 largest U.S. companies is implementing controls, according to a recently released study by International Resource Development, Inc. (IRD) located here.

The study, which deals mainly with personal computers and communicating word processors (CWP), is titled "PCs vs. CWPs in the Clerical Workstation of the Future." It identifies top management strategy for limiting equipment purchase to a few of the many vendors.

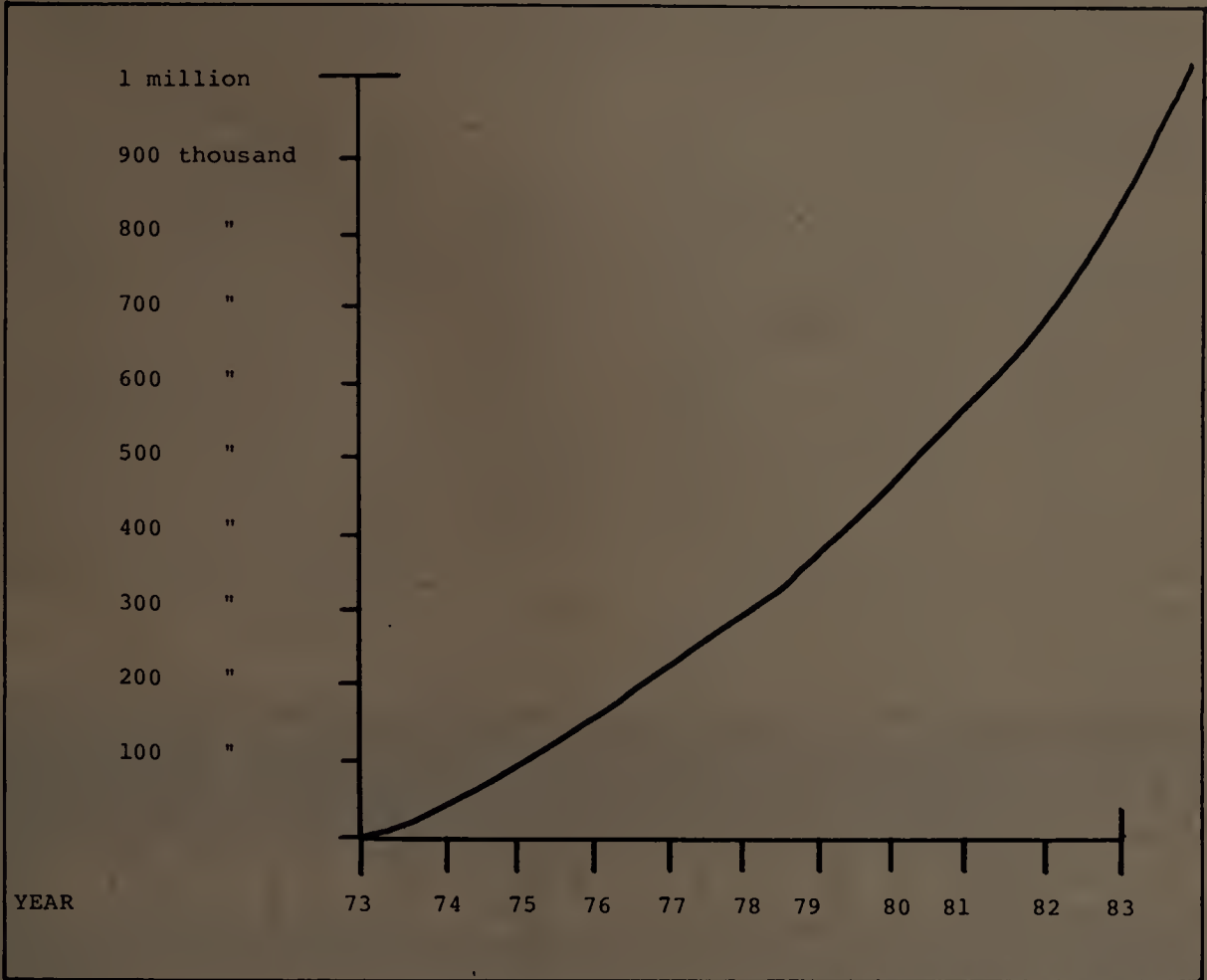
Hardware and system vendors that will most often be selected in this group are IBM; Wang Laboratories, Inc.; Xerox Corp.; and AT&T, respectively. Vying for fifth place will be Digital Equipment Corp. and NBI, Inc., the study said.

'Will Not Survive the Decade'

"All other CWP vendors will either not survive the decade or will be relegated to the status of turnkey systems houses," the study said.

Also predicted by the study was that both the dedicated word processor and the personal computer will be replaced in the office this decade with highly developed multifunction workstations.

According to the report: "These machines will incorporate voice, data, text communications and service as a portable telephone, word processor, data base



CWP Installations, 1973 to 1983

Chart by International Resource Development, Inc.

manager, information librarian, financial analyst, graphics plotter, electronic postman, mainframe terminal and office administrator." These functions were predicted to be available for \$5,000 by 1993.

Voice synthesis and recognition were predicted to play a large role in the next

decade's workstations. These two technologies will be made possible with the coming generation of 32-bit microcomputers and 256K-byte random-access memory chips.

The study called the Xerox Star work-
(Continued on Page 148)



The Wells Fargo Bank training center familiarizes employees with the text processing system from Interactive Systems Corp.

Bank Streamlines Communications With Mail System

SAN FRANCISCO — An electronic mail system at a large banking group based here has brought about dramatic changes in the daily interaction and decision-making processes of both upper management and secretaries alike.

Wells Fargo Bank is the oldest bank in California, established in 1852. It holds the position of fourth largest bank in the state and the 12th largest in the nation with more than 350 branches throughout California. Mid-1983 assets were \$25.7 billion, according to a bank spokesman.

More than 10% of Wells Fargo Bank's 16,800 employees are currently using the electronic mail system, which links all regions of the institution's retail banking group plus its executive office and data

(Continued on Page 148)

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System Streamlines Communications for Bank

(Continued from Page 147)
center. The bank plans to double that figure by 1984 as the system continues to streamline the communications process, increase timely decision making and improve user productivity.

The system, referred to within the bank as the Test Processing System (TPS), runs on four Digital Equipment Corp. PDP-11/70 computers and is built around a system of intelligent terminals and Unix-based software from Interactive Systems Corp. of Santa Monica, Calif.

First units of TPS were acquired in 1977, according to Mary Wikstrom, vice-president and manager of the Internal Systems/Services Division. The system originally ran on a single

DEC PDP-11/70, and its only application was to provide text processing in a shared mode for 20 technical writers.

'More Than Text Processing'

"We soon realized that the system enabled us to do much more than text processing," Wikstrom said. "As people learned the value of the electronic mail features, the network was expanded, and a second DEC PDP-11/70 was purchased. Today, we have four PDP-11/70s in Northern California and one in Southern California, and the network supports nearly 2,000 users on approximately 375 terminals."

A dial-up connection links about 200 users who are outside either Los

Angeles or San Francisco, where the computers are located. Wikstrom said the list of names and departments wanting to join the TPS network has grown tremendously. The bank is resisting the temptation to expand too rapidly, which would risk degrading the system. It does not carry excess capacity because of cost considerations.

The primary reason given for the heavy TPS demand is that the system improves the productivity of its users. In addition to its communications function, it is also used as a word processor, an electronic file cabinet and an electronic calendar that can be programmed to act as the user's tickler system.

Eliminating "telephone tag" is

one way TPS increases a user's efficiency, said Susie Samson, assistant vice-president of the bank's Corporate Strategy & Systems Department.

"Intercepting busy managers for a telephone conversation at the exact moment they have free is almost impossible," Samson said. "Written material could be hand delivered, but only to addressees within walking distance."

Of even greater importance to users is the system's ability to cut the time necessary to make decisions. Administrative chores are now less time consuming, so most communications and decisions can now be completed the same day, reported Pat McGuire, senior vice-president and manager of the bank's Peninsula Retail Banking Region.

The system also allows the decision-making process to occur away from the office, explained Jack Kopeck, executive vice-president and manager of the Consumer Credit Division.

Approximately 80% of the Wells Fargo users are professionals and executives, and 20% are secretarial and administrative. Most are unfamiliar with computers, Wikstrom said, but the average system orientation period is a maximum of one week, with most users becoming productive within a couple of days.

"The biggest hurdle for the novice electronic mail user is to learn to deal with a nonsequential system when he is used to a completely sequential device like the telephone," Wikstrom said. "When you're on the telephone, no one else can communicate with you, and you accomplish each communication task in a sequential manner. That's not the case with electronic mail."

Study Examines How to Buy Micro, WP Unit

(Continued from Page 147)

station the first incarnation of such a multifunction office workstation, followed by Apple Computer, Inc.'s Lisa. It also predicted that IBM will come out with a similar workstation by the end of this year.

"IBM will be coming out with two 4300 desktop workstations with a number of attributes of the Apple Lisa," according to IRD President Ken Bosomworth. "I'm sure it will be in the same price range."

Bosomworth also said that IBM's recent acquisition of 15% of Rolm Corp. is related to the "preferred vendor" criterion for office-automation hardware. "IBM saw a once-in-a-generation opportunity to lock out most of its competitors from the large organization personal computer and office automation business," he said, "but in order to do so it needed a really full product line, including private branch exchange (PBX) and local-area network linkages."

Bosomworth also predicted that IBM will offer both a local-area network and a PBX by early 1984.

The study costs \$1,650 from IRD, 30 High St., Norwalk, Conn. 06851.

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Analysts Say Only a Few Will Dominate Shakeout Forecast in Business Micro Mart

By Patricia Keefe
CW Staff

Despite mushrooming demand, a shakeout of the business microcomputer market within the year is inevitable, if not already under way. And only a few vendors — among them IBM, Apple Computer, Inc., Tandy Corp. and possibly Commodore Business Machines, Inc. — are

Software Piracy: Formulating A Plan for Protection

By Joseph I. Rosenbaum
Special to CW†

Software piracy has rapidly become the industry problem of the '80s.

The proliferation of personal computers has magnified the problem to the point where some software vendor executives estimate a yearly loss of 30% of revenues to software pirates. Considering the market predicted for personal computers, the economic threat to the software industry is awesome (one recent article anticipates software sales alone to exceed \$16 billion by 1986).

Although software piracy has been the focus of attention in the courts, the press, professional journals and the legislature, it has been difficult to formulate a comprehensive plan that would ensure adequate protection for software. This article attempts to propose a simple, effective methodology designed to help stem the tide of software piracy.

'Shrink-Wrap' Licenses

Many programs are mass marketed with a warranty/license visible through the diskette wrapper. Breaking open the wrapper is stated to be acceptance of the "license" terms, which usually prohibit resale, copying or distribution. Although the enforceability of these "shrink-wrap" licenses has never been tested in the courts, actual enforcement is difficult and has not been an effective deterrent to piracy.

(Continued on Page 154)

likely to emerge unscathed from the fallout, according to industry observers.

Although the market is expected to settle down quickly with a few suppliers, there will be all sorts of subspecialty markets emerging "where IBM can't be bothered," the analysts added. Also, few, if any, mergers or acquisitions are expected to result from the shakeout.

Moreover, unlike the deadly battles in the home computer arena, a price war will not be key to the business micro shakeout because competing vendors know IBM can charge less and get away with it, analysts agreed. Knowing that IBM is the "lowest cost producer" and will win any price war, other vendors "are real afraid" to start anything, according to Kenneth Bosomworth, president of International Resource Development, Inc. of Norwalk, Conn.

Software Teledistribution May Put Retailers Out of Work: Study

NORWALK, Conn. — Many software retailers may end up out of a job, replaced by advanced communications techniques that download increasingly complex software programs electronically.

Retailers may benefit greatly at first when software teledistribution begins to catch on, as software suppliers download programs directly to retailers upon receipt of order, relieving retailers of inventory burdens.

But later in the teledistribution technological cycle, when high-speed data transmission direct to consumers is more feasible, the retailers' distribution will start to crumble. This advanced capability will be available by the early 1990s.

These are some of the findings issued in a recent report by International Resource Development, Inc. (IRD), a Norwalk, Conn.-based research firm.

The first teledistribution overtures are already being made to retailers, the report stated, with companies setting up systems to download software to local distribution centers housed in retail stores. Given viable alternatives, most software suppliers, particularly of microcomputer programs, would rather not bother with manufactur-

Conversely, Greg Kelsey, of Hambrecht & Quist, Inc. of San Francisco, suggests that IBM "is not willing to accept Commodore-type profit margins."

"We are already seeing it [the shakeout] if you look at firms that have been public for one to two years. In the mini days, firms never stumbled as quickly after going public," said Carol Murator, research analyst at Prudential-Bache Securities. A stronger view holds that not only has the shakeout been under way for a while, it is accelerating, according to analysts like Kelsey.

Similar to Upheaval in Auto Mart

Industry analysts likened the predicted shakeout to the upheaval that occurred in the U.S. automobile market, whittling an excess of 100 manufacturers down to four
(Continued on Page 152)

ing and distributing scores of floppy disks, considering the current problems associated with them. These problems include returns, updates, lack of shelf space and so forth.

There are many formidable obstacles in the way of a full-blown implementation of software teledistribution, the report continued. The most prominent, perhaps, is the issue of illegal copying of software once it is downloaded, as well as predictable protests from middlemen and distributors of software. Said one IRD researcher, "These guys stand to lose their jobs even before retailers, and if they have any clout at all, they will be putting pressure on the suppliers to stick with their normal distribution."

Eventually, the advent of high-speed transmission direct to consumers will displace about \$2.6 billion in potential software sales from retailers to downloaders within 10 years, the report warned. Direct broadcast satellite and a digitized telephone network are two technologies that will set the erosion in motion.

The report is priced at \$1,850 and is available from IRD, 30 High St., Norwalk, Conn. 06851.

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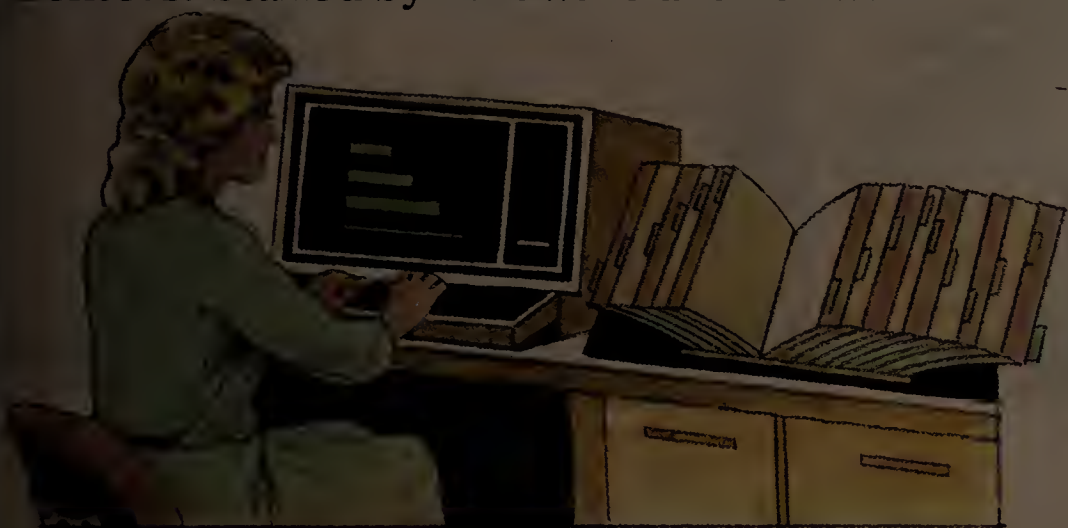
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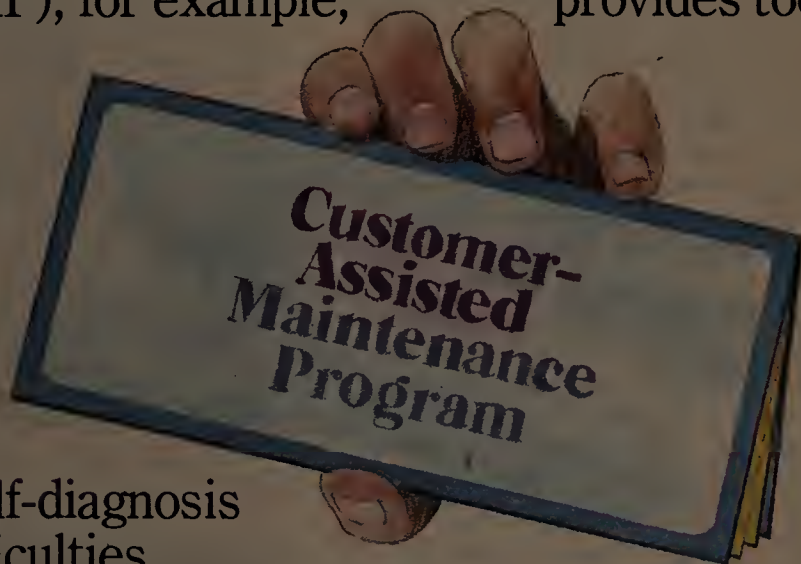


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Amdahl Calls Article on Its 5880 'Misleading'

SUNNYVALE, Calif. — Amdahl Corp. has labeled "misleading" an article in the Aug. 23 Dow Jones News Service that suggests shipment delays of Amdahl's 5880 computer will have a "substantial negative effect" on the vendor's 1984 financial results and "seriously reduce" its lead time on IBM products.

In a statement also released Aug. 23, Amdahl asserts that "revenues from the 5880 sales were never expected to be substantial in 1984 or beyond." The 5880 is a multiprocessor configuration with planned shipments for mid-1984 and is targeted for a market "of limited volume," the vendor explained.

Shakeout Predicted In Micro Mart

(Continued from Page 149)

major contenders. As happened in the automobile industry, those personal computer/desktop micro vendors who cannot hope to compete with the big guns in the business micro market can survive only by carving a niche in a specialty market, according to Bosomworth.

"To survive, smaller companies must do something that IBM can't do for the same money, or do what it can do for a lot less," consultant Marc Rudov of Venture Development Corp. added.

These niches include vertical markets, such as medical applications; lap-size machines; peripherals; software; and portable computers.

Only one of the analysts interviewed, Bill Ablondi of Future Computing of Dallas, said he did not subscribe to the theory of a coming shakeout in the business micro market.

In fact, Ablondi expects the number of entrants into the personal computer arena to grow.

Future Computing believes that eventually 75% of all office workers will have personal computers — 30% by 1988, he said.

Murator projects real market penetration beginning in 1985, agreeing that the market is far from reaching the point of saturation.

IBM Is Micro King

The undisputed king of that market is IBM, analysts agreed. Although a latecomer to the personal computer market, IBM has seized 20% of the available market share in two years, according to Harry Edelson, analyst for First Boston Corp.

A trend in the establishment of corporate microcomputer procurement policies, many of which specify IBM Personal Computers [CW, Aug. 29] will help increase IBM's market share, Rudov said.

"People who bought Apple's computer products are no longer doing so; they are buying IBM," he added. "People ordered IBM [Personal Computers] before they ever saw them — that's amazing," he remarked. "They feel they can't lose with IBM."

Apple is universally held to be the runner-up to IBM, although Rudov is not so sure it will always be No. 1.

Moreover, it is revenues from its 5870 computer that are "expected to be substantial in 1984 and to increase in the following years," the statement said. The 5870 is said to be a tightly coupled dual-processor system targeted for the high-performance, general-purpose volume market.

Previously scheduled for delivery by year-end 1983, the 5870 is now slated for shipment during the first quarter of 1984. This delay is not expected to produce any negative fi-

nancial impact.

However, the 5880 was originally targeted for availability in the second half of 1983. The firm, which had hoped to ship the 5880 in the first quarter of 1984, has since revised that estimate to the second quarter. Amdahl officials had attributed the 5880 delay in part to demands other developments had placed on its engineering development efforts, one of which is said to be IBM XA compatibility.

Also, a report that Amdahl is hesi-

tant to ship the 5870 before it has largely completed IBM XA compatibility development was labeled "a fair statement" by Kenneth W. Simonds, Amdahl executive vice-president, according to a published report.

Simonds is reported to have said that Amdahl's concurrent 5870 and XA development efforts have contributed to a "cautious approach" to early 5870 shipments, resulting in an expansion of preshipment 5870 testing efforts.

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Hot NCC Exhibitors Drop Plan to Sue Anaheim

By Jeffrey Beeler

CW West Coast Bureau

BEVERLY HILLS, Calif. — A group of National Computer Conference (NCC) exhibitors whose booth personnel allegedly suffered physical ailments last May in the show's sweltering pavilion area has abandoned plans to file a personal injury claim against the city of Anaheim.

But the vendors still express a willingness to sue the conference's sponsor and the NCC's air-conditioning contractor in an effort to re-

'Although some of their people had gotten sick during the conference, the companies finally decided that getting involved with the city in an administrative demand just wasn't worth it.' — attorney Michael Dempsey.

cover their alleged 'NCC '83-related financial losses, according to the exhibitors' legal counsel, Michael Dempsey.

Threats of a personal injury claim against Anaheim public officials

were first heard in late July, about two months after NCC '83 ended. If it had been filed, the claim would have taken the form of an "administrative demand," a legal document in which an aggrieved party formally

makes its complaint known to a potential defendant and demands reimbursement.

Under California law, a private litigant is required to submit an administrative demand before it can proceed with a lawsuit against a government agency.

The law also requires an injured party to file its demand no later than 100 days after the offense in question occurs.

So in the case of the exhibitors at this year's May 16-19 NCC, the deadline for filing an administrative demand was Aug. 24. But the vendors let the date come and go without submitting the necessary papers.

"Although some of their people had gotten sick during the conference, the companies finally decided that getting involved with the city in an administrative demand just wasn't worth it," Dempsey explained.

In any event, a claim against the community would have covered only the exhibitors' personal injuries during the show, not their financial losses, he added.

Simmering Dispute

The question of whether the vendors should file a damage claim was prompted by a simmering legal dispute stemming from a massive air-conditioning failure three months ago in a makeshift NCC exhibit "hall."

The breakdown repeatedly sent show floor temperatures soaring above 100°F and may have persuaded many potential visitors to shun the hall, which housed the exhibitor overflow from the conference's main display site, the Anaheim Convention Center.

In an attempt to compensate themselves for their alleged lost sales leads, the disgruntled vendors began threatening last May to join in a class action lawsuit against NCC's sponsor, the American Federation of Information Processing Societies, Inc.

Since then, the exhibitors have expanded their list of possible defendants to include NCC '83's air-conditioning contractor, Houston-based Mobile Air Conditioning, Inc.

Although the firms have yet to make good on their threat, the possibility of legal action apparently remains strong, despite their failure to act against the city of Anaheim.

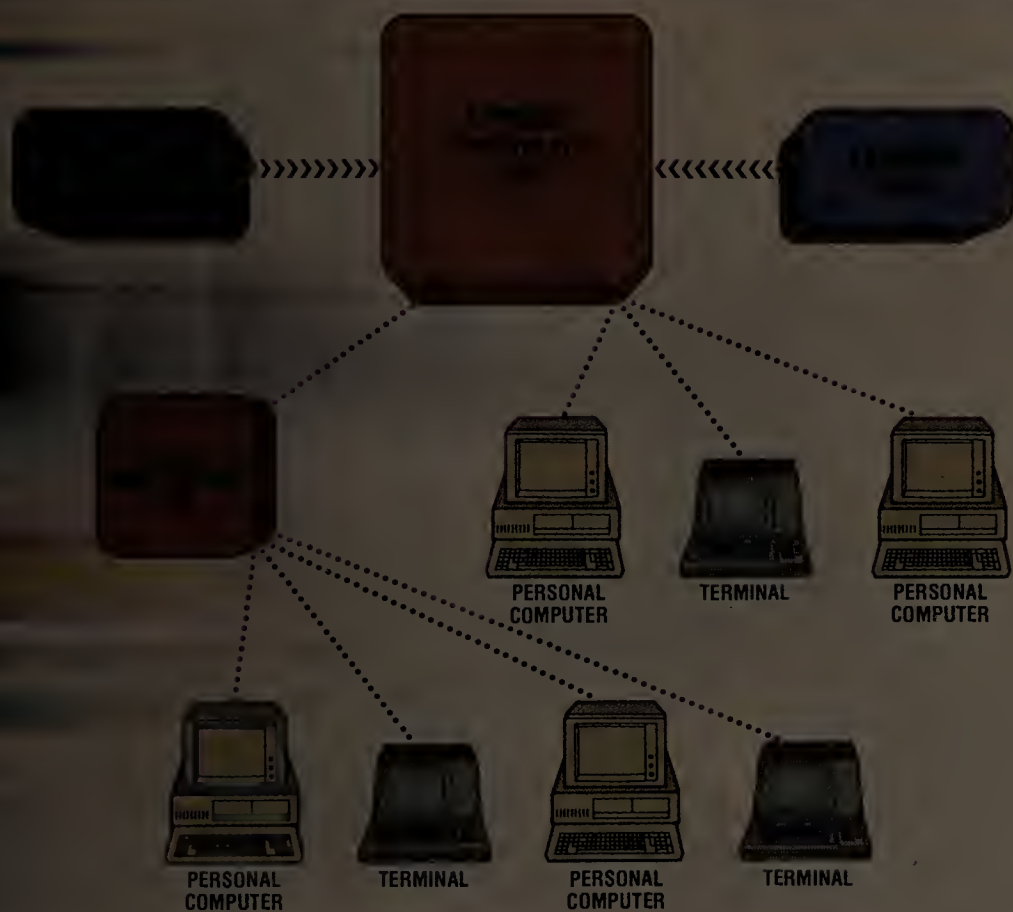
During the last three months, approximately 60 NCC pavilion exhibitors have expressed an interest in joining the proposed suit and have submitted their names to the local law firm of Kinley, Kumble & Wagner, where Dempsey works.

In addition, a significant fraction of the vendors — "the number is somewhere in the teens" — have already gone as far as to provide the law firm with retainer checks, Dempsey said.

But movement toward a class action suit continues to be slow.

"A lot of people just seem to be waiting around to see what everyone else is going to do," he said. "I keep telling them all that if they're going to make a move, they'd better do it soon before we drift into the next show season," Dempsey said.

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Developing a Plan for Protection of Software

(Continued from Page 149)

It is well known that software can be programmed to execute its instructions a predetermined number of times before stopping. This so-called "time-bomb" in the software is often used where customers are provided software on a trial basis or where periodic license renewals must be carefully monitored. Once the trial period is successfully concluded or re-

newal fee paid, additional program instructions furnished to the customer's system enable the software to remain functional for continued use.

Another related technique is the coding of software to enable it to operate only on a specific computer. This requires the inclusion of a serial number within the internal structure of each computer so that software,

properly encoded, will be "recognized" for operation on that specific machine and no other.

Suppose, in conjunction with the purchase/license of the software program on a diskette, the purchaser received the shrink-wrapped license as previously noted. Assume further that the purchaser was required by the terms of the license/warranty to return a prepaid regis-

tration card identifying the specific serial number of the customer's computer and was similarly notified that the "time-bomb" feature would render the program useless at some predetermined time unless the customer complied.

Upon receipt of each card, the owner/licensor would promptly return to the registered customer additional and specifically encoded

program instructions that would simultaneously deactivate the time-bomb, permitting continued use, and encode the software to restrict its use to the serial-numbered machine specified by the customer. Thus, any attempted use of the software on another machine would be prevented since it would reactivate the time-bomb.

While permitting sufficient time for the rightful owner to apply for and obtain new code for any legitimate substitute or replacement computer the customer might acquire, this feature would effectively limit continued improper use.

Cooperation Required

From a technical point of view, the implementation of such a proposal requires some degree of cooperation between the hardware manufacturers and software licensors.

The actual cost and effort required to add the hardware technology and software programming would probably be minimal compared with the potential revenues otherwise lost to piracy.

In addition, the administration and monitoring of such a program would require an efficient support staff within the software owner/licensor's organization (probably the largest cost factor involved).

Despite the additional costs of implementing this type of program, there are significant incentives for the computer industry to do so. Most computer hardware manufacturers are also major marketers of computer software — increasingly in the personal computer market. To the extent that hardware manufacturers add the required features to their machines, developers of software programs will tend to write programs for the machines that are most likely to protect their investment.

Encoded software is more readily traceable and a list of known customers more readily obtainable, a feature that would save time and money in litigation. Warranty service, updates and new releases would also be more accurately controllable by the owner/licensor and further afford an opportunity to ensure compliance with license terms.

There are numerous advantages to the adoption of such a program and few, if any, disadvantages.

Rosenbaum is an attorney with the general counsel's office at American Express Co. in New York and has served as chairman of the International Computer Law Subcommittee.

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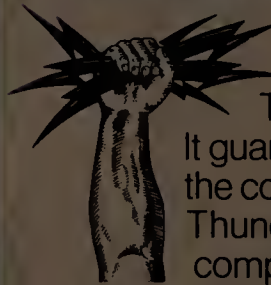
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Marketing, User Liaison Cited as Potential Pitfalls

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — Too much dependence on technology, poor liaison with users and incomplete marketing strategies are among the major pitfalls that confront high-technology companies, a senior management specialist claimed here.

Marketing, in particular, is increasing in importance, said David Anderson, assistant professor of behavioral and policy sciences at MIT's Sloan School of Management. He was interviewed here late last month at the Integral Systems, Inc. Users Conference '83.

"Frequently, high-tech managers

put the marketing function in place and think that will solve their problems. They think the way to fix things is to bring in a marketing whiz kid. That will not do it because marketing needs to be integrated in a company; it is the scientists and engineers themselves who need to be intimately in touch with their customers," he asserted.

HP Cited

Anderson, former consultant at McKinsey & Co. and a key researcher of the best-selling book *In Search of Excellence*, cited Hewlett-Packard Co. as an example of how to institute a marketing strategy.

"Most people would think of HP as a technology-based company, as opposed to IBM, which is clearly marketing driven. That is true, and yet real product planning in HP is carried out by market-oriented engineers," he contended.

To be successful, high-tech companies must be user driven "through and through," Anderson declared. The excellent companies often use their technicians as early users to iron out bugs in a system, and firms such as IBM intentionally lag the state-of-the-art technology in order to identify correctly the required marketing strategies.

Many companies, however, do not pay enough attention to what their users are telling them, he suggested. "It is critical in high-technology companies that computer scientists and engineers are exposed to the business aspects of their corporations. AT&T, for example, has eight to 10 levels of management who have never sold anything to anyone. It will take 20 to 30 years to turn that culture around, and in highly competitive markets, most manufacturers cannot afford that luxury," he warned.

From Excellent to Great

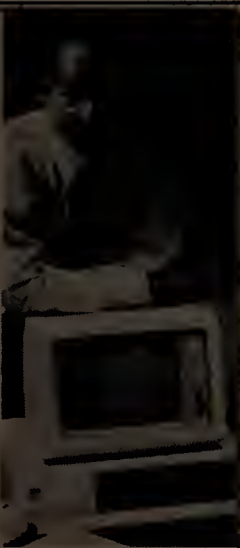
Most great companies, Anderson continued, started out as excellent companies. The key is to maintain excellence. "Successful high-technology companies develop everything from accounting systems to marketing in line with building and sustaining excellence. Unfortunately, many companies do not make the transitions required by growth very well. They fall victim to their own bureaucracies, and they buy into gimmicky ideas which do not benefit them in the long run," he said.

Anderson stressed leadership as a critical ingredient in building and sustaining growth in high-technology enterprises. It is vital to evolve management structures in line with the company's expansion, while remaining true to the company's overall philosophy, he attested.

"The key to success for many of these large, established high-tech manufacturers is that they act as though they are small. For example, Hewlett-Packard is much bigger than it was a decade ago, and while top managers do not have the close contact with employees and users that they used to have, they have found new ways of staying in communication," he noted.

How Art Blumenthal

"dumped the dumb"



Art Blumenthal knows his stuff. An 11-year IBMer, he now heads the firm that is the largest third-party programmer for System/34 and System/36 in the Baltimore area.

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Copyright Ruling Reversed

PHILADELPHIA — A U.S. Court of Appeals here has reversed a lower court ruling that denied a motion for a preliminary injunction brought by Apple Computer, Inc. against Frank-

Raytheon Inks Agreement, Moving Into OA

NORWOOD, Mass. — Raytheon Data Systems Co. has signed an agreement with Convergent Technologies, Inc. for workstations and business computers to be used in a new line of office automation (OA) equipment the company said it is planning.

In making the announcement, David A. Steadman, Raytheon's president, said the agreement allows the union of Raytheon's software and terminal product line with state-of-the-art processors from Convergent. The agreement, he said, will accelerate Raytheon's move into office automation with a series of products slated to be announced within the next 12 months.

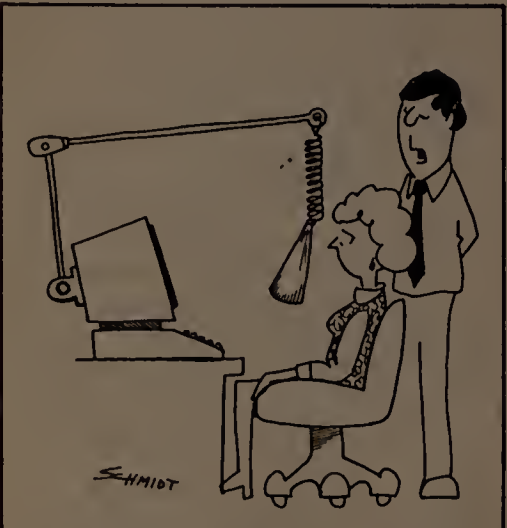
A division of Raytheon Co., Raytheon Data Systems currently supplies IBM 3270-compatible terminals. The company entered the word processing market via the acquisition of Lexitron Corp. in 1978.

GE Purchases CAE Operation From Comsat

WASHINGTON, D.C. — Comsat General Corp. and General Electric Co. announced the purchase by GE of Comsat's digital electronics computer-aided engineering (CAE) business, a deal valued at about \$14 million.

Comsat has retained the microwave portion of its CAE business and has established a subsidiary, Compact Software, Inc., to develop and market microwave circuit-design tools, the company said.

According to GE, its acquisition reflects the company's commitment to CAE and computer-aided design, particularly as the two relate to the market for electronic systems and components. The operations acquired include simulation software for integrated circuits and printed-circuit boards, as well as other CAE software.



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The court ruled that Apple's programs for the Apple II personal computer, particularly those stored in the system's read-only memory (ROM) components and operating software, are subject to copyright protection. The court ordered the case back to the lower court for further proceedings.

A year ago, a U.S. District Court judge denied Apple's motion for a preliminary injunction, ruling that the copyright law was unclear as it pertained to operating systems. Apple had filed suit against Franklin in May of 1982, charging the company with infringement of patents and copyrights in claiming that Franklin had copied Apple's programs onto diskettes and ROM components.

McAuto Fails to Meet Quotas Firm Wins Right to Nix Pact

RALEIGH, N.C. — Claiming its marketing agent, McDonnell Douglas Automation Co. (McAuto), failed to sell enough copies of its hospital accounting software, Management Systems Associates, Inc. here has won the right to break its exclusivity contract with McAuto and offer its software through direct marketing and other contractual agreements.

In addition, Management Systems was awarded \$256,500 in royalties resulting from McAuto sales of the software.

A jury verdict Aug. 19 in U.S. Federal Court for the east district of North Carolina in Raleigh determined that a 1980 agreement granting McAuto Health Services Division

exclusive marketing rights to Management Systems hospital accounting software was not valid because McAuto failed to satisfy sales quotas set down in the agreement.

A spokeswoman for Management Systems said the contract specified that if McAuto failed to meet certain sales quotas over a two-year period, Management Systems would be free to market the software in the "general hospital market."

The verdict before Judge F.T. Dupree Jr. granted Management Systems the right to sell its software without restriction. A Management Systems' spokeswoman said the software firm was now free to seek another marketing agent.

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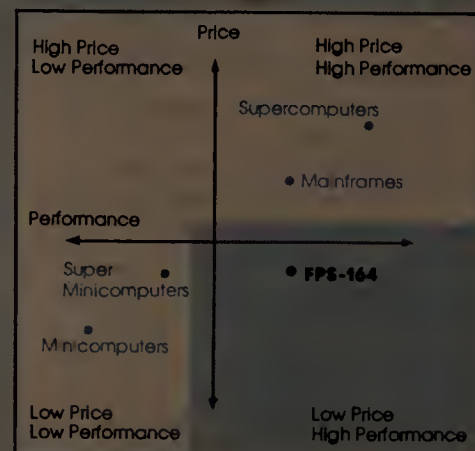
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$$\begin{bmatrix} c_1 & d_1 & 0 & e_1 & & & & \\ b_2 & c_2 & d_2 & 0 & e_2 & & & 0 \\ 0 & b_3 & . & . & . & . & & \\ a_4 & 0 & . & . & . & . & . & \\ & a_5 & . & . & . & . & . & \\ & . & . & . & . & . & . & e_{n-3} \\ & & . & . & . & . & . & 0 \\ 0 & & . & . & . & . & . & d_{n-1} \\ & & & . & . & . & . & c_n \\ & & & & a_n & 0 & b_n & c_n \end{bmatrix}$$

Many scientific and engineering applications use sparse matrix methods in their problem solving. The FPS-164 is especially suited for these operations which can account for up to 95% of the CPU time.

Slowdown Predicted for Second Half

Chip Industry Seen Enjoying Boom

By Robert Batt
CW West Coast Bureau
SUNNYVALE, Calif. — Growth in the integrated circuit industry will slow down in the second half of this year but still maintain a healthy growth over 1982, attendees at the Status 1983 Mid-Term seminar here were told last week. Richard Skinner, president of Integrated Circuit Engineering Corp. (ICE), a Scottsdale, Ariz.-based research firm, which sponsored the seminar, said due to substantial pent-up demand, the integrated circuit industry has recently enjoyed a "tremendous expansionary boom."

In the first half of 1983, he asserted,

CW at Status '83

ed, the industry book-to-bill ratio stood at an all-time high of 1.5:1 compared with around 1.1:1 a year ago. "While we do not believe that these levels can be maintained through the remainder of 1983, we expect that very healthy ratios of 1.2:1 to 1.3:1 should be the norm by the fourth quarter of 1983," he said.

Skinner said future growth in the semiconductor industry will be heavily dependent on the nation's

overall economic performance. The 8% increase in gross national product in the second quarter of this year is directly responsible for the surge in demand for integrated circuit devices, he maintained.

Skinner predicted that if 1984 economic growth is sustained at levels similar to 1983, integrated circuit industry growth rates will exceed 20%. However, he warned, federal budget deficits currently projected at more than \$200 billion could dampen long-term economic recovery.

"Overall, ICE believes that the sheer momentum of bookings in the first half of this year should result in 1983 being a good year. If the federal



Richard Skinner, president of Integrated Circuit Engineering Corp.

budget deficits are reduced we also predict excellent growth in 1984-85," he said.

The market in 1983, with the firming up of prices, has become a "seller's" market, Skinner told his audience. Coinciding with this price stabilization is an even greater rise in the forecast 1983 U.S. integrated circuit production. Through May of this year, he noted, total solid-state and integrated circuit billings have increased 4% and 7% respectively.

But Skinner warned that double ordering is definitely taking place, induced by panic buying from semiconductor users.

"Although it does require some time before production lines can be switched from standby to full speed, the double ordering must be taken as one moderating factor of the present and future book-to-bill ratios," he added.

Many U.S. semiconductor makers, he declared, are hesitant to commit themselves fully to increasing production drastically for fear of a sudden slowdown in orders.

"Another, and just as frightening fear, is that of not adding capacity quickly enough to meet the surging demand and, subsequently, losing market share," he said.

Skinner said manufacturers such as Intel Corp. and Advanced Micro Devices, Inc. that have steadily added capacity through the recession, as in the form of new facilities, are currently in the best position, as their choice becomes one of staffing the existing facilities or not.

Turning to overseas competition, Skinner said Japanese growth rates are forecast to stay slightly higher than those of both U.S. and European manufacturers through 1985.

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Exacerbated by VLSI Devices

Semi Demand Seen Leading to 'Capacity Crunch'

By Robert Batt

CW West Coast Bureau

SUNNYVALE, Calif. — Heavy demand for semiconductor devices will lead to a "capacity crunch" in the latter half of the 1980s, the Status '83 Mid-Term Seminar here was told.

Speaking on the subject of integrated circuit industry capacity concerns, David

Cochran, vice-president of Integrated Circuit Engineering Corp. (ICE), sponsors of the seminar, said that since it takes at least two to three years to bring a facility fully on-line, substantial additional capability will not be available until at least 1986.

"The future U.S. integrated circuit capacity situation is exacerbated by very large-

CW at Status '83

scale integration [VLSI] devices. Many manufacturers, even if they possess adequate floor space, are not able to re-model quickly enough to of-

fer high-density, state-of-the-art components," he explained.

In addition, although almost all new investment dollars are for VLSI capacity, the extremely high cost of a world-class VLSI production model — over \$60 million — serves to moderate additional output capability, Cochran added.

"Some of the present financial troubles in the U.S. integrated circuit industry are attributable to manufacturing overcapacity in specific product areas, coupled with an inability to convert quickly a facility to another process technology," Cochran told his audience of around 120 semiconductor users and vendors.

Better Position

The ICE executive said that with the majority of capacity problems likely to be concentrated among VLSI devices, Japanese manufacturers are in a better position to meet increased demand. This is because major Japanese integrated circuit producers have continued to increase semiconductor capital spending through the 1981-83 recession period.

"The concentration of the Japanese spending has centered primarily on high-density dynamic memory component capacity such as the 64K- and 256K-[byte] dynamic random-access memory devices." This investment in future VLSI capacity will result in a slight drop in U.S. integrated circuit market share by 1990, Cochran said.

While U.S. semiconductor manufacturers have proclaimed the virtue of spending through a recession, he said, in practice the pressure on American companies to look financially favorable from quarter to quarter has limited investments. "Unfortunately, simply holding your own may not be enough in competing for future VLSI [integrated circuit] market share," he noted.

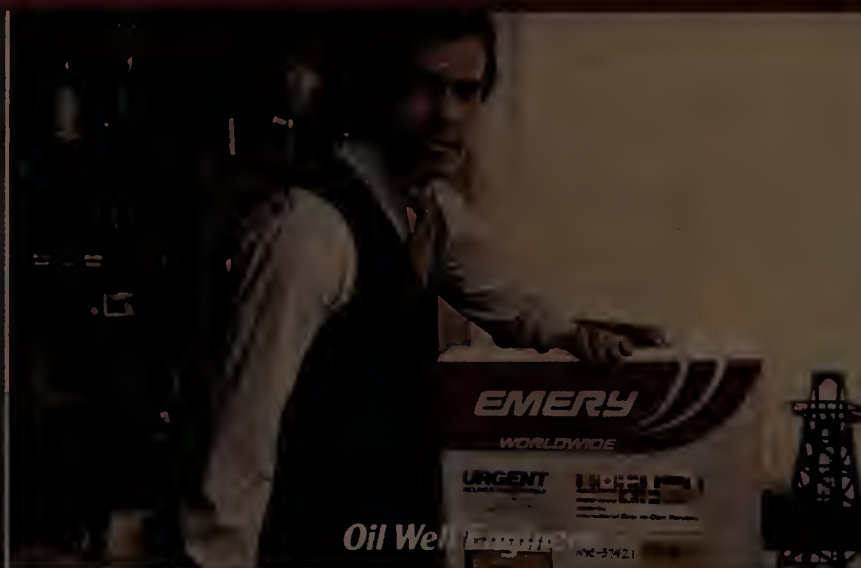
Turning to the question of assembly capacity, Cochran claimed that a serious assembly and testing shortage is currently creeping up on the integrated circuit industry.

"One reason for this impending situation is that although the dollar volume change of [integrated circuit] sales for U.S. producers was essentially flat in 1981-1982, unit volume increased by 15%. Moreover, the strong surge in demand for semiconductor components over the past few months has added impetus to the concern over overseas assembly."

There is, Cochran asserted, a move back toward on-shore reproduction in fully automated plants as a way of shortening manufacturing supply lines. "If you can shorten your pipelines by a month, it means you can defer altering your capacity for almost a year," he explained.

Overall, Cochran concluded, the shortage of assembly capacity is likely to persist.

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Sees Mixed Picture for TI VP Analyzes Losses in This Year's Semi Mart

By Robert Batt
CW West Coast Bureau
SUNNYVALE, Calif. — Texas Instruments, Inc., Fairchild Camera and Instrument Corp. and Signetics Corp. are the semiconductor manufacturers who have fared the worst during the past 12 months, according to an industry specialist. Speaking at the Status '83

Mid-Term Seminar here, William Strauss, vice-president of Integrated Circuit Engineering Corp. (ICE), which sponsored the seminar, said TI's announced loss of \$100 million in the second quarter will result in a slowing of sales in the company's semiconductor operations. The losses, said Strauss, are largely due to TI's mis-

judgment of the personal computer market, and these losses are expected to continue into the third quarter. Large volumes of semiconductors are sold internally to the company's consumer operations group. However, the current three-month inventory of personal computers will serve to slow semiconductor sales through the

CW at
Status '83

rest of 1983, he explained. "TI is literally in a panic mode at the moment. There are people in the organization who do not know who

their boss is, due to recent management restructuring. Many employees in the semiconductor group are angry with people in other parts of the organization, and this has caused a severe morale problem," he claimed.

One approach to TI's current problems, Strauss suggested, is to sell its personal computers at a much reduced price. This, he contended, would create a tremendous installed base which could serve to strengthen software and peripheral sales and its associated semiconductor segment.

Despite its recent troubles, the ICE executive noted, TI remains the largest merchant integrated circuit supplier in the world, with total 1983 revenues expected to reach \$1.15 billion, climbing by 18% to \$1.36 billion in 1984.

On the healthier side, Strauss observed, TI seems to be strengthening its position in the semicustom market. It is developing a Cmos process through an agreement with Harris Corp., and there are also plans to offer a library of standard cells to customers within the next six months, he told his audience.

"Considering some of TI's past inattention to the needs of the marketplace, we hope that the customer service required to gain a position in the semicustom market will be emphasized," he added.

Turning to the problems at Fairchild, Strauss said the manufacturer had this year dropped out of the top 10 merchant semiconductor suppliers, its slot being taken by the up-and-coming Advanced Micro Devices, Inc. (See story on Page 164).

"Fairchild's plummet (Continued on Page 164)

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Who's on Top in Integrated Circuit Industry

By Robert Batt
CW West Coast Bureau
SUNNYVALE, Calif. — While some semiconductor manufacturers fared poorly over the last 12 months (see story on Page 163), the integrated circuit industry also came up with some winners and a few surprises, attendees at the recent Status '83 Mid-Term seminar were informed.

Motorola, Inc. retained its position as the top merchant semiconductor supplier (Texas Instruments, Inc. is No. 1 in integrated circuit production worldwide), while both NEC Corp., the Japanese manufacturer, and Advanced Micro Devices, Inc. (AMD) made major strides, the attendees were told.

"Motorola will strengthen its lead in 1983 as the largest open-market semiconductor manufacturer in the world. NEC, with 20% growth forecast for 1983, has acquired second place, with TI relegated to third place," William Strauss, vice-president of Integrated Circuit Engineering Corp. (ICE) told his audience.

ICE, which sponsored the seminar, said Motorola is clearly the market leader because it has the most developed product line in the industry. Its decision early in the recession to retain some aging lines, such as discrete devices and older bipolar products, also aided its fortunes, Strauss said.

Motorola and Intel Corp. are the only U.S. manufacturers involved in bubble-memory devices, Strauss observed, and the company's recently announced agreement with Sagem of France for the production and marketing of Motorola 256K-byte and 1M-bit bubble memories will strengthen its position in an emerging market.

"Another anticipated product that should create interest is Motorola's 32-bit microprocessor, which will be offered only in Cmos technology.

Others Fared Poorly

(Continued from Page 163)
from 1980 integrated circuit sales of \$450 million to 1983's forecast revenues of \$360 million is indicative of the serious situation the company is desperately trying to reverse," Strauss asserted.

Schlumberger Ltd., which acquired Fairchild in 1979, has proven to be ill-equipped for managing a semiconductor firm, he said. Despite investments of over \$1.5 billion, integrated circuit sales have decreased by almost 30%.

"Some key engineering and management talent has already left Fairchild, and in an industry of strong personalities, the lack of a dominant figure at the top of the company and the mass decentralization of its organization have left many programs without the necessary support," Strauss contended.

As an example, he continued, the company's newly designed dynamic random-access memory has been in the sampling stage for months, but no actual product introduction has occurred.

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Sampling is scheduled for late 1983, preceding a similar Intel product by at least one year and potentially providing an excellent market position for Motorola," Strauss claimed.

The rise of NEC to second place, he continued, emphasizes the increasing penetration into the market of non-U.S. companies. In 1977, he attested, no Japanese companies were among the top 10 semiconductor manufacturers; now, there are four — NEC, Hitachi Ltd., Toshiba

(Continued on Page 165)

1983 POSITION	COMPANY	1982 \$ M	1982/1983 %	1983 \$ M
1	MOTOROLA	1270	16	1475
2	NEC	1100	20	1320
3	TI	1227	7	1310
4	HITACHI	800	22	980
5	TOSHIBA	680	15	780
6	NATIONAL	690	10	760
7	INTEL	610	18	720
8	FUJITSU	440	20	530
9	PHILIPS	500	4	520
10	AMD	336	22	410

Worldwide Top 10 Merchant Semiconductor Suppliers

Chart Courtesy of ICE

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U.S.-Japan Trade Deficit in Semis to Increase

By Robert Batt
CW West Coast Bureau
SUNNYVALE, Calif. — The U.S. trade deficit with Japan in semiconductor devices will increase to its highest ever level this year, participants at the Status '83 Mid-Term seminar were warned.

William Strauss, vice-president of Integrated Circuit Engineering Corp. (ICE), the seminar sponsor, said that in the first half of this year, the U.S. trade deficit with Japan in integrated circuits surpassed the \$130 million deficit recorded for the whole of 1982.

While U.S. exports of integrated circuits to Japan are expected to increase by only 10% to 15% this year, Japanese exports of integrated cir-

cuits to the U.S. are expected to grow by almost 45% for 1982 to 1983, he said.

"The early figures for 1983 indicate an acceleration of the U.S. deficit. Clearly, there is some basis for concern by U.S. semiconductor manufacturers," Strauss said.

The ICE executive said the recent high value of the U.S. dollar against the Japanese yen was aggravating the problem, and most financial analysts believe the U.S. currency is overvalued by as much as 20% against its Japanese counterpart.

Strauss predicted that exports of Japanese integrated circuit products to the U.S. will climb from \$470 million in 1982 to \$1.1 billion by 1986. Total Japanese semiconductor pro-

CW at
Status '83

duction over the same period will increase from \$4.6 billion to \$9.7 billion, he added.

"A moderating factor to the Japanese increasing worldwide [integrated circuit] export volume is the movement toward establishing foreign-based facilities. However, as the 256K-byte [dynamic random-access memory (RAM)] begins to be produced in volume in 1985-86, [integrated circuit] exports to the U.S. can again be expected to rise substantially," he noted.

Strauss said ICE forecasts that Japanese-based supply of semiconductor devices will account for just over 7% of U.S. consumption during 1983, rising to as much as 9% over the next three years. U.S. integrated circuit supply will account for between 10% and 12% of total Japanese integrated circuit consumption over the same period, he said.

ICE also expects to see more U.S./Japanese technology agreements, Strauss added, similar to the one negotiated between National Semiconductor Corp. and Oki Semiconductor, Inc. for the development of 64K bytes of dynamic RAM.

"We believe there will be numerous future technology exchanges between the U.S. and Japan when beneficial to both parties. This will promote a more homogeneous [integrated circuit] market and should also serve to eliminate preconceived notions, such as that the Japanese are not competitive in microprocessors," he continued.

Many Japanese companies, Strauss asserted, particularly Nippon Electric Co., are expanding their production facilities both at home and overseas, notably in the U.S. and Europe. The focus of most of this increase, he said, is directed toward high-density dynamic and static RAM. Also, the intention of many Japanese companies to incorporate 125mm and 150mm silicon wafers is a key ingredient in their future high-volume production plans.

"Overall, the Japanese semiconductor manufacturers seem well prepared for future [very large-scale integration] MOS memory demands.

Motorola No. 1 In Production

(Continued from Page 164)

Corp. and Fujitsu Ltd., as well as one European company, N.V. Philips of The Netherlands.

The Japanese dominate the increasingly important memory market, he declared. One-quarter of all integrated circuits in the world are memory-based, Strauss added, with Hitachi rivaling NEC as the premier manufacturer of memories.

The most startling progress among the top 10 manufacturers, Strauss asserted, was made by AMD. The company is predicted to advance from seventh place to hold the No. 5 slot among the world's top 10 integrated circuits suppliers in 1983, passing ahead of Fairchild Camera and Instrument Corp. and Signetics Corp. ICE also predicted AMD will climb to No. 10 among semiconductor manufacturers.

"AMD managed to have a relatively strong showing throughout the recession largely due to its selection of less price-sensitive products and markets. For example, it has been absent from the 64K [dynamic random-access memory] market until prices recently stabilized," Strauss noted. Largely due to its product mix (55% bipolar devices and 45% MOS), the company is in an excellent position to realize substantial sales growth as the recession recedes.

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IBM Predicted to Overtake Apple in Office Mart in '83

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — IBM will overtake Apple Computer, Inc. this year in its market share of office personal computers, according to Future Computing, Inc. Chairman Egil Juliussen.

Speaking at a seminar here on the IBM Personal Computer market, Juliussen said IBM's Personal Computer revenue will surpass \$1 billion in 1983, with Big Blue becoming the largest personal computer manufacturer.

Future Computing predicts that the office personal computer market will reach \$4.2 billion this year, with

IBM holding 26% of this market; Apple Computer, Inc., 21%; Radio Shack, 13%; and Hewlett-Packard Co., 6.5%.

The Richardson, Texas-based research firm predicted IBM's Personal Computer revenues will climb to \$8.8 billion by 1988, and that the Personal Computer will account for 15% of IBM's revenues.

Overall, the company predicted, the worldwide office personal computer hardware market will increase from its current \$8.4 billion to \$39.6 billion by 1988.

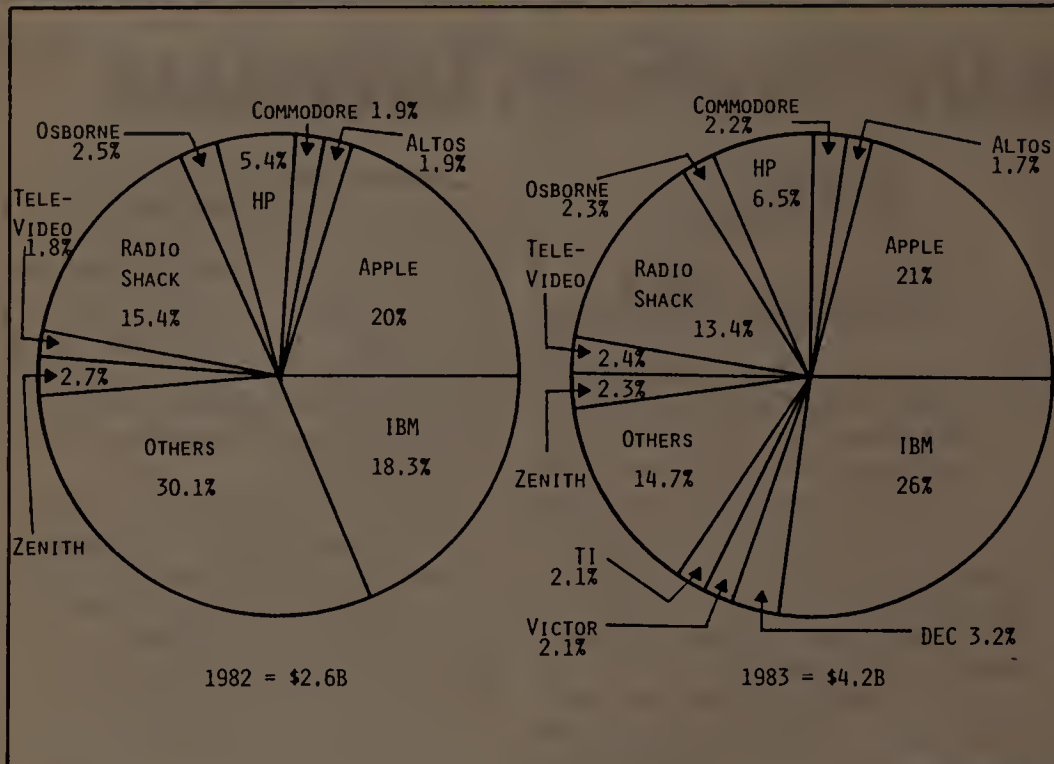
Juliussen said that while only 7% of office workers in the U.S. currently use personal computers (3.8 million computers in total), this will rise to 75% by the end of the century.

In a paper presented at the seminar, Future Computing said IBM's Personal Computer success story is based on having the right hardware, software and marketing plans.

Owing to its open architecture, the computer has attracted support from over 150 third-party software companies, the paper continued. The Personal Computer is building a de facto standard software base for 16-bit personal computers and is the choice for new product development by most software publishers.

Another key factor in IBM's success, the paper asserted, is that the Personal Computer is supported by a comprehensive distribution strategy. Over 800 computer stores are selling the machine, according to Future Computing with Fortune 1,000 companies also served by IBM's direct sales force.

Having achieved parity with its strongest competitor, Apple, within two years, IBM is in a position to push home its competitive advantage, Future Computing said.



Source: Future Computing, Inc.
U.S. Market Shares of Office Personal Computer Manufacturers

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Micro Evolution Seen Motivating Use of Standards

By Robert Batt

CW West Coast Bureau

SAN FRANCISCO — The evolution of personal computer architecture over the next few years will drive the industry increasingly toward adopting more standards.

So claimed Portia Isaacson of Future Computing, Inc., sponsor of a recent seminar here on the IBM Personal Computer. The question of which standards to adopt will make or break personal computer manufacturers in years to come, Isaacson asserted.

"We believe there will be both primary and secondary standards in various segments of the personal computer market, and these will be decided in the next few years," she told her audience of DP professionals.

Isaacson said that in order to qualify as a standard, a product must be available from multiple independent suppliers, so that computer manufacturers, software suppliers, retailers

(Continued on Page 168)

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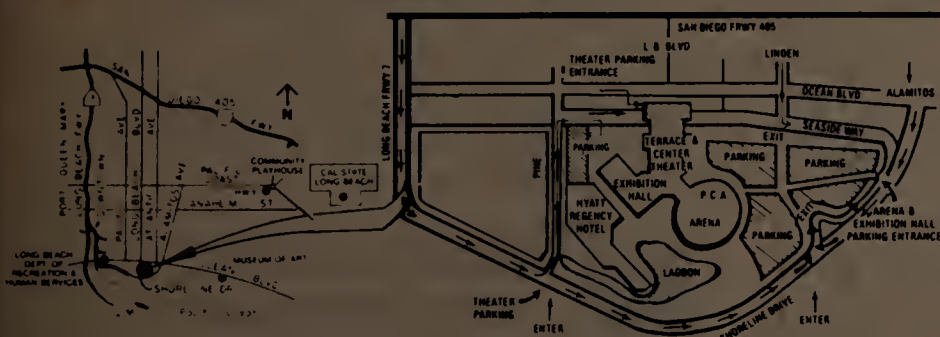
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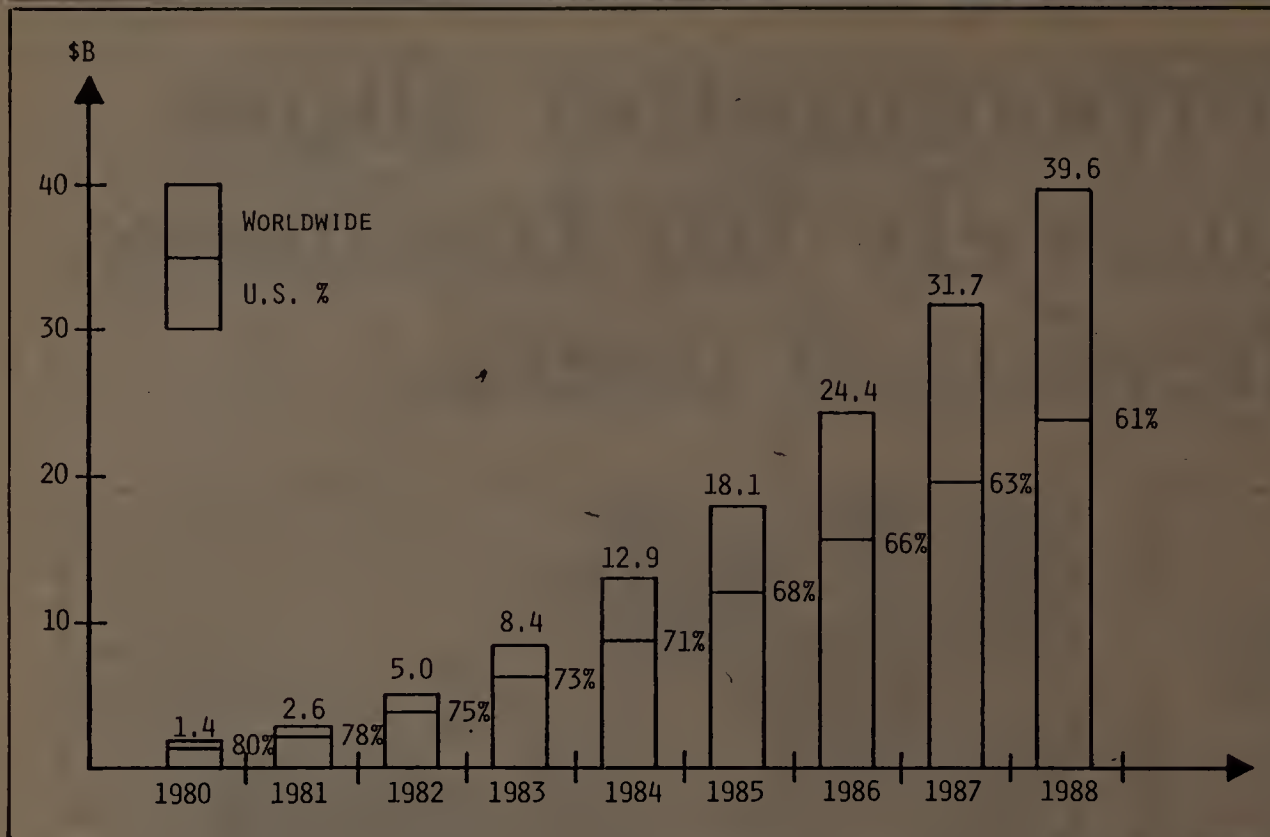
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Source: Future Computing, Inc.

Worldwide Office Computer Retail Market, Excluding Personal Computers

More Standards Seen for Micros

(Continued from Page 166)
and end users have access to the machine, independent of any one vendor.

"It is conceivable, for example, that a non-IBM company could develop the IBM Personal Computer architecture on its own, independent of IBM, and establish an industry standard," she said. "We also believe that IBM

could well introduce a separate personal computer product, not based on its current architecture."

Isaacson asserted that it is in the best interests of IBM to be the leader in establishing industry standards for personal computers. It could, she suggested, adopt more than one standard operating system since different cus-

tomers require different operating systems.

"The only remote possibility that IBM may revert to using a proprietary operating system for its personal computers is if it wishes to tie these machines to its mainframe links," she said.

Isaacson acknowledged that, in setting standards, IBM is helping other manufacturers to enter into the market, including the Japanese. However, IBM's strong position among retail outlets will make it very difficult for other firms, she said.

Trilogy To Go Public In October

By Robert Batt

CW West Coast Bureau
SANTA CLARA, Calif. — Trilogy Ltd., the two-year-old enterprise set up by former Amdahl Corp. chairman Gene Amdahl to manufacture IBM plug-compatible mainframes, has announced that it will go public next month.

In the last week of August, the company, based here, filed a proposal with the Securities and Exchange Commission to sell up to 6.9 million shares of stock valued at \$103 million.

The underwriting, managed by Merrill Lynch Capital Markets, brings the company's cash horde to around \$180 million. Of that, about \$70 million is reportedly designated for research and development, \$30 million for capital equipment, \$20 million for marketing and around \$50 million for manufacturing.

Amdahl and his son Carlton, vice-chairman of Trilogy, will each retain 5.7 million shares.

Tandem to Give College \$1 Million in Equipment

CUPERTINO, Calif. — Tandem Computers, Inc. plans to donate \$1 million in computer equipment and services to Foothill College here.

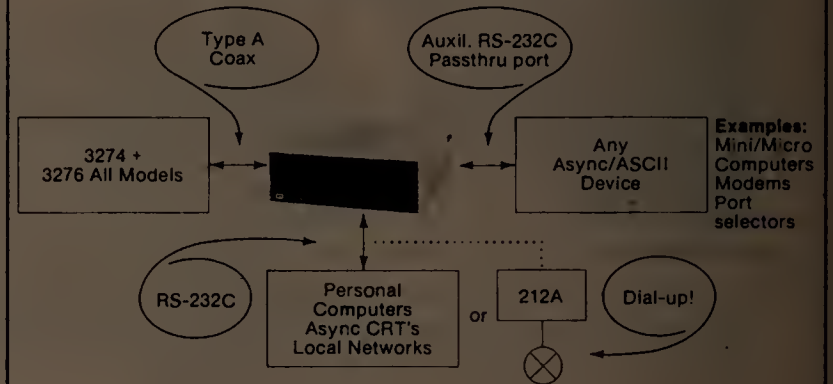
The donation is meant to aid undergraduate education at the community college by making the vendor's Tandem Nonstop computer system accessible to 5,000 students in the Foothill computer

classes through 60 terminals in the college's computer center.

A newly designed computer room on the Foothill campus includes a Tandem Nonstop system with six separate processors.

Technical instruction for Foothill faculty and staff is being provided by Tandem at the vendor's San Mateo, Calif., training center.

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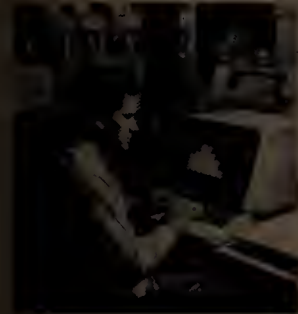
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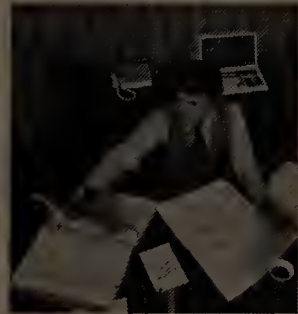
Systems Programming, Software Development, Software Engineering, Data Base Systems, Telecommunications, Technical Writing. \$24,000-\$56,000.

Those with several years of systems software, data base, telecommunications or fault tolerant transaction processing systems experience will be able to gain exposure to some or all of the following: MVS, JES3, CICS, IMS/DL-1, TCAM, VTAM/NCP, OCR, duplex lines, modems, programmable line concentrators, switches, CRT'S, IBM up to 3083's, 4341-2's, Amdahl 2660's and Tandem Non-Stop systems, and a variety of others including most types of mini/micro-computers. Assignments range from development and modification to maintenance, support and technical documentation of advanced data base and data communications software, graphics, CAD/CAM and distributed processing. Many firms offer formal training and day-to-day contact with some of the top technical professionals in the country. There are senior software positions available as well as ground-floor software positions for Applications Programmers who are strong in Assembler.



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Many openings exist for persons with systems development or audit backgrounds ranging from Junior Analyst to Senior Project Manager. Experience in manufacturing, finance and/or distribution information systems is particularly valuable. A number of organizations participating in the Conference will offer current Applications Programmer Analysts the opportunity to move directly into systems design projects. Those more senior are sought for Project Manager openings. Many larger organizations who are now planning ambitious expansion programs will provide formal management training and development. Several smaller or intermediate size firms now making their initial thrust into computing—especially in mini/micro areas—are seeking persons to help them develop and oversee new systems technology.



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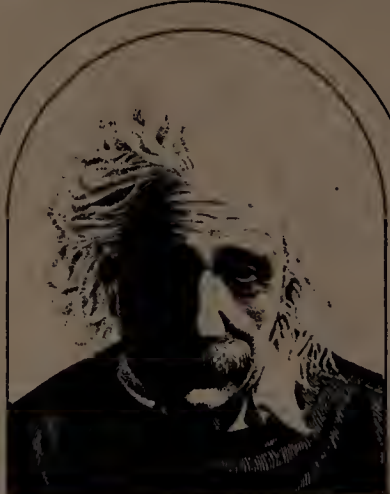
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International firm has an outstanding opportunity for a professional with expertise in either VTAM or IMS. Will be leader of major conversion effort. Excellent career potential.

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Company in need of person w/proven managerial and technical abilities to direct new product development. Will also be responsible for product budgeting. Technical skills preferred are in area of communications and large IBM mainframes.

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\$25-55,000

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Major manufacturer seeks a staff specialist with a DP background. Will evaluate hardware & software proposals, work with vendors, handle contracts, and coordinate computer expansions.

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Progressive firm with IBM 4341 DOS/VSE shop seeks a manufacturing and inventory systems expert. Will code in COBOL, CICS and DL/1. Excellent relocation package and fringe benefits.

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Patricia Brown
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San Francisco, CA 94111
(415) 434-1900

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Minimum of bachelor's degree (or equivalent experience) is required for all positions. Master's or Ph.D. in a related field preferred for the Academic Services Manager. Send resume and salary requirements to:

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Requirements: 1) Broad-based computer science background (BS/MS) with mathematical and statistical skills (chemistry background a plus); 2) working knowledge of Fortran, Basic, Cobol; 3) proven ability as an innovator and problem solver; and 4) strong communication skills. Successful experience as a computer professional up to 5-7 years acceptable.

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Duties include assisting with the installation and the maintenance of the IDMS Database Systems Software and providing technical assistance in the analysis and feasibility of new database applications. Requirements for the position are knowledge and expertise in the following areas: COBOL and Assembler Programming Language, CICS Programming, IDMS Data Manipulation Language (DML) Usage, IDMS Data Dictionary Usage, IDMS/CUL-PRIT Programming. Intangible benefits include small population approximately 30,000 city life, excellent outdoor life, beautiful surroundings, opportunity to live affordably within walking distance of work or within a 20 minute drive with acreage in the country. Apply by 9/27/83 to Chuck Matule, Dept. of Administration, Computer Services Division, Room 7, Mitchell Bldg., Helena, Montana, 59620. Applicants will be notified of further application requirements. An Equal Opportunity Employer.

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APPLICATIONS PROGRAMMER

Requires minimum three years of scientific programming experience, Fortran, and some exposure to real-time systems. Familiarity with UNIX desirable; astronomy background a strong plus.

For consideration, send your resume to:

Personnel Manager

**National Radio Astronomy
Observatory**

Edgemont Road, Charlottesville, VA. 22901

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Systems Programmer

Sought by the Massachusetts Institute of Technology's Laboratory for Computer Science to assist in the development of graphics interfaces and data base software and other support software for an integrated VLSI design system to be used on LISP machines. Requires BS in computer science or equivalent combination of education and experience. Extensive programming experience in LISP and familiarity with LISP machines essential. Previous experience with silicon compilers and other VLSI design tools preferred. Some MOS circuit design experience desired.

Please submit 2 copies of resume, referencing Job No. R1185 to: MIT Personnel Office, 77 Massachusetts Avenue E19-239, Cambridge, MA 02139. MIT is an equal opportunity/affirmative action employer.

MIT

MUNICIPALITY OF ANCHORAGE

Anchorage, Alaska

The Municipality of Anchorage has immediate requirements for two senior level positions in Anchorage, Alaska.

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\$34,819 to 44,512 Annually DOE

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\$38,272 to 48,818 Annually DOE

To qualify candidates must have five years of systems software programming experience to include OS/MVS/CICS background, MVS Systems generation, assembler language, file organization techniques, and data communications preferably in a large main frame IBM environment. Two of the five years must have included project leader and/or supervisory experience over systems programmers. A degree in computer sciences or a related field is preferred.

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Data Processing

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Requires a minimum of 2 years experience on a data base management system with knowledge of OS-JCL. Exposure to ADABAS, CICS and NATURAL would be a real plus.

SENIOR SYSTEMS PROGRAMMER - IBM

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Communications network development, software support, software development, software test. M68000 system, UNIX, "C", network multiple VAX processors. RSX11-M, PDP 11 MACRO, VAX/Assembler. Division of Fortune 500 Company needs 2 yrs exp to Mgmt level. Sal: mid \$20K's to mid \$40K's, management level sal not limited, all fees and relocation paid. Immediate hires, send resume to:

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Please submit resume or letter of qualifications, including salary history to:

Personnel Manager
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SYSTEMS ANALYST

Support All Aspects of Company Operations With a Leader In Energy Services Products

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You'll determine user needs; set priorities; write systems specifications and guide MIS staff in implementation; evaluate hardware/software; and provide training in use of applications such as cost monitoring, critical path scheduling, etc. Requires at least 10-15 years related experience, as well as a BS in Engineering with additional systems education.

SR. TECHNICAL PROGRAMMER ANALYST

You'll define, develop and implement complex, engineering systems; prepare documentation and manuals; evaluate hardware/software; and educate users. At least 6 years Fortran experience is required, plus a computer-related BS degree.

SR. PROGRAMMER ANALYST

You'll redesign and rewrite a Shop Order System to make it completely on-line. This will become the nucleus for other applications. Needs analytical skills to implement requirements in COBOL to replace or integrate with existing PL/1 system. Requires BS in Computer Science and at least 4-8 years experience with COBOL, PL/1 and VSAM in an IBM/DOS/CICS environment. Also knowledge of Parvalet/Easytrieve and manufacturing/engineering applications.

We offer a stimulating professional environment, competitive salaries and benefit package, plus ample potential for advancement. For confidential consideration, send resume indicating position of interest to: Personnel Department, Babcock & Wilcox, Industrial Power Generation Division, 4282 Strausser N.W., North Canton, Ohio 44720.

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Babcock & Wilcox
Industrial Power Generation Division

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California Federal, one of the nation's largest financial institutions, has immediate openings for high-caliber technical support personnel. Our systems include multiple Sperry 1100/80 and IBM 3083 computers, installed at our new Service Center in Rosemead, California.

Advanced Software Specialist (OS-1100) Provide operating system support to Sperry 1100/80 computers. Experienced in SYSGEN's TCF application, and panic dump analysis.

Advanced Software Specialist (CMS/TELECON) Provide TELECON support to five 95 Sperry DCP/40's, controlling 100+ branch network and 300+ in-house terminal system. Experienced in TELCON and CMS support.

Transaction Processing Group Leader Minimum of six years' maintaining or enhancing Sperry 1100 Control Software. Fluent in COBOL and 1100 Assembler. Minimum of two years' technical supervisory experience.

Data Base Group Leader Experience with hierarchical data base management systems in a large business environment. Minimum two years' technical supervisory experience required.

Senior Data Base Specialist (DMS-1100) Minimum of four years' experience using and maintaining DMS-1100. Experience with IBM data base products desirable.

Senior Systems Programmer (CICS) Three to five years' systems and programming experience in current CICS software products, such as CICPARS, DLI, MRO, ISC, PA II, OMEGAMON CICS. Experience in network products such as ACF/VTAM and ACF/NCP a plus.

Applications Support Analyst Provide technical support to applications programmer/analysts. Heavy COBOL experience in a transaction processing/data base management environment required. Responsible for second-level problem resolution.

Senior Programmer Analyst Responsible for host-to-teller machine interfaces. Minimum four years' COBOL programming experience. Knowledge of a major vendor's Assembler is desired.

Programmer/Analyst Responsible for host-to-teller machine interfaces. Minimum two years' COBOL programming experience.

Senior Hardware Specialist Assist the supervision of all installation and maintenance activities. Extensive knowledge of Sperry (1100 series) or IBM large-scale, multi-processor hardware configurations, lay-outs, and diagnostic techniques mandatory.

Senior Performance Analyst Experience with System Control Software on Sperry 1100 or IBM 303X systems. Solid performance analysis experience which includes the use of system modeling.

Advanced Software Specialist (MAPPER) Provide MAPPER support, including MAPPER GENs. Plan, test, and implement new releases of MAPPER, and other system processors, as assigned. Knowledge of COBOL, SSG, and ASM required.

Manager, Network Department Responsible for the design and maintenance of a network supporting nearly 1,000 devices. A management track record, with a minimum of 6 years' experience in DP communications is mandatory.

If you are qualified and are interested in working in a dynamic and professional environment, we would like to talk to you.

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Data Base Software Developer will design and develop data management subsystems and user interfaces. Applicants must be familiar with query language design, relational data base theory, SQL, and indexing methods. A master's degree in computer science is preferred. Knowledge of SAS software is a plus.

MVS Systems Programmer will support MVS and MVS/XA systems software and related products on an IBM 3083 processor. Duties include installing, maintaining, enhancing, and modifying IBM and OEM vendor software products; working with operations personnel in problem solving; and providing assistance to internal users. Applicants must have a minimum of five years' systems programming or technical support experience with three years as an MVS systems programmer. Experience with SMP and technical proficiency in Assembler language are required. Experience with JES2, TSO, and ACF/VTAM is highly desirable. Knowledge of PL/I and IMS/VS or CICS/VS is a plus.

OS/VS Assistant Systems Software Developer will develop and maintain the SAS system supervisor and related components for the IBM OS/VS and MVS/XA environments. Use of IBM 370 Assembler as a programming language and exposure to OS/VS supervisor and data management services macros are required. Experience with the development and support of large software systems and the use of IBM service aids is desirable. Familiarity with operating system concepts, compiler design and implementation, PL/I, and the SAS system are significant assets. A bachelor's degree, preferably in computer science, or equivalent experience is required.

VM/CMS Systems Programmer will support VM/CMS systems software and related products on an IBM 4341 processor. Duties include installing, maintaining, enhancing, and modifying IBM and OEM vendor software products; developing system utilities; working with operations personnel in problem solving; and providing assistance to internal users. Applicants must have a minimum of two years' systems programming or technical support experience with one year as a VM/CMS systems programmer. Technical proficiency in Assembler language is required. Knowledge of VSE/VTAM and VCNA is a plus.

VM/CMS Systems Software Developer will develop and maintain VM/CMS systems software for internal applications and Institute Program Products. Applicants must have a minimum of one year's experience as an OS/VS or OS/MVS systems programmer, and one year's experience as a VM/CMS systems programmer as the most recent job experience, including writing SVC traps, I/O traps, and applications requiring knowledge of the VM/CMS Assembler macros. Candidates must possess excellent Assembler language knowledge and use Assembler as the primary programming language. A working knowledge of PL/I and SAS software is also desirable. A bachelor's degree, preferably in computer science, and excellent communication skills are required.

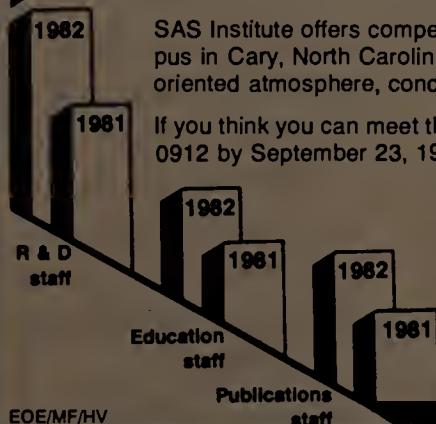
Systems Programmer will support compiler and minicomputer interface development for SAS software under several mini and microcomputer operating systems. Applicants must have demonstrated growth potential and three years' experience in systems development. In-depth knowledge of PL/I is required and knowledge of SAS software is highly desirable. A bachelor's degree, preferably in computer science, is required.

Technical Representative will provide the marketing interface with sales, product development, contracts, and corporate communications for developing product training, sales literature, and advertisements. The individual will also serve as a technical resource for marketing. This position requires thorough knowledge of SAS software, the ability to work with people with various technical backgrounds, and excellent written and verbal communication skills. Sales or business experience is an asset. A B.S. degree and two years' SAS experience are required.

Software Sales Representatives will license software products to new sites and current sites. Applicants must have a minimum of two years' sales or marketing experience, and software and programming experience. Educational requirements include an advanced degree in a technical discipline with a non-technical undergraduate degree, or an MBA or equivalent degree with a bachelor's degree in a technical field.

Instructors will teach a variety of SAS training courses. Formal training in data processing, and teaching or public speaking experience are required. Applicants must have a bachelor's degree, preferably in computer science, and a minimum of one year's SAS programming experience. An advanced degree in an applied field is a plus. This position requires 10 days of travel per month.

Video Product Developer will develop video-based courses, including video programs and all support materials. Applicants must have two years of video project design experience and an educational background in instructional design and television production. Experience with interactive video programs, computer-assisted instruction, and SAS software are significant assets. A demo tape is required.



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UVAH has a need for a Lead Engineer to assist in the acquisition and installation of a major health care information system (hardware and software). Prefer experience with DOS/VSE or VM. IBM 370, 4341, 308X or compatible mainframe.

Primary duties will be the technical support of the systems. Candidate will be expected to evaluate propose configurations, establish the system network, perform sys gens, monitor and tune the system, perform capacity planning, etc.

Experience interfacing multi-vendor environments a plus.

Degree in Computer Science, Management Information, Engineering, Mathematics or a related discipline preferred.

Apply University of Virginia, Department of Personnel Administration, Carruthers Hall, P.O. Box 9007, 1001 Emmet Street, Charlottesville, VA 22906

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In a multi-computer system duties include: evaluating, testing and installing modifications to system software; advising application programmers and operations personnel and ensuring the further development, growth and reliability of communication systems. Knowledge of DEC 10/20 System and SMP functioning is essential.

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Duties include: Project investigation and organization and direction of systems analysis, design, programming, implementation and user training; oversees work of project managers and programmers. Required knowledge of DEC 10/20 or comparable computer system and significant systems management and supervisory experience. Strong communication skills essential.

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You must have a minimum of 3 years' sales experience, with a proven record in the micro-based computer/communications field. Familiarity with some of our product functions is essential; degree preferred. To qualify for sales management, you must have demonstrated supervisory background, and, of course, heavier experience. Earn exceptional commissions and benefits, while based in your choice of: Boston/Springfield, Stamford/Hartford, Syracuse, Albany, New York City, New Jersey, Philadelphia, Pittsburgh,

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You will be responsible for pre- and post-sales software installation/support, demonstrations, applications software design, troubleshooting, and high level problem resolution. Your diversified responsibilities require proven expertise in programming, telecommunications, and application software analysis/design. Immediate openings in your choice of: Detroit, New York, Philadelphia, New Jersey, Washington (DC), Nashville, Atlanta, Minneapolis, Omaha, San Francisco, or Los Angeles.

Enjoy outstanding compensation, commensurate with your experience; and the diversity of our product line, affording you the opportunity to expand your knowledge of DP and achieve a sense of participation and visibility within the Company. Principals only, send your confidential resume, indicating earnings history/expectation and position/location preference, to: Mark T. Atherton, Director-Human Resources, Mohawk Data Sciences, Seven Century Drive, Parsippany, NJ 07054. MDS is an equal opportunity employer M/F/H/V.

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Battelle, a leader in research and development, has opportunities available for experienced computer scientists and engineers. The following positions require a BS degree in Computer Science or Electrical Engineering. An advanced degree is desirable.

SIGNAL/IMAGE PROCESSING ENGINEER—Duties include the development of signal processing, pattern recognition and image processing methodologies for nondestructive testing, manufacturing automation, inspection systems, and robotics.

DATABASE/GRAPHICS RESEARCHER—Duties include the design and development of innovative graphical techniques, database management, and user interfaces for analyzing large complex data sets.

AI/EXPERT SYSTEMS RESEARCHER—This position involves the development of expert/knowledge based systems for a variety of applications including process control, robotics, computer/user interfaces and demographic data interpretation.

COMPUTER SYSTEMS ENGINEER—Duties include the design, development and implementation of real-time computer systems for data acquisition and process control. Data General experience desirable.

HUMAN FACTORS ENGINEER—Duties include the design of computer/user interfaces, expert systems, and systems design for maintainability.

MICROPROCESSOR ENGINEER—Duties will include hardware and software development for microprocessor-based data acquisition, process control, signal processing and AI systems.

We offer excellent opportunities in career development, professional atmosphere, excellent salaries and generous benefits. U.S. citizenship required. Send confidential resume including salary history to: Loren Henderson, Battelle Northwest, P.O. Box 999, Richland, Washington 99352. An equal opportunity employer m/f.



Pacific Northwest Laboratories

SYSTEMS ANALYST—Design, development, & implementation on-line systems programs rtd to financial insts. Maintenance & enhancement of syst. & provide vital skills to ensure successful & cost effective operation. B.Sc. in Com.Sci., Math. or Engineering Science. Must have knowl. of CICS, DL/1, PL/1, DMS & ADABAS. 2 yrs exp. or 2 yrs programming. \$29,700 p.a. to work 37½ hrs/5 days/wk. CAP Information Systems, Inc. 521 Fifth Ave., NYC, NY 10175. PLS SEND RESUMES.

ALASKA SYSTEM 34/38 PROGRAMMER

Programmer for System 34/38 installation. Qualified applicant must be well versed in RPG II, RPG III (OCL, CL, SEU, DFU) and all 34/38 utilities. Prior experience on System 34 and System 38 required. Must relocate to Barrow, Alaska, a remote bush community. Only those applicants willing to live in the Arctic need apply. Excellent benefits furnished. Salary \$48,000 to \$54,000 DOE. Send resume to:

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Fairbanks, AK 99707
No phone calls

COMPUTER SCIENCE INSTRUCTOR

Master's degree and 18 grd. hours in the computer science or related area. Knowledge of BASIC, COBOL, FORTRAN, and RPG languages. Prior industry experience in programming and computer applications helpful. Prefer prior teaching experience. Salary dependent upon education/experience, competitive benefits. Applications accepted until position filled. To apply contact: Personnel Office, Lake City Community College, Rt. 7, Box 378, Lake City, FL 32055 (904) 752-1822 ext. 313.

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DIRECTOR OF COMPUTER SERVICES UNITED STATES NAVAL ACADEMY ANNAPOLIS, MARYLAND

The United States Naval Academy, the undergraduate institution of the Navy, with an enrollment of 4600 midshipmen and a full-time faculty of 550, invites nominations and applications for the position of Director of Computer Services. This position, reporting directly to the Superintendent, U.S. Naval Academy, is responsible for all aspects of academic and administrative computing. This includes developing long range ADP plans, preparing operating budgets, recruiting staff, system development and procurement of ADP equipment.

The Director of Computer Services provides leadership and direction for the Academy's computing environment. This position provides an opportunity for the Director to have a major impact on computing innovations affecting the Academy's academic programs and administrative systems. In addition, the Director of Computer Services, with the assistance of a Deputy Director, has direct administrative responsibilities for the Naval Academy Computer Center. The Center has a full-time staff of 50 and features the Dartmouth Time-Sharing System which utilizes a Honeywell DPS 8/50 computer system with dual processors and over 500 terminals. Midshipmen and faculty academic and research usage is approximately 70% of the total utilization. Additional computer systems are featured in the administrative offices as well as engineering and science laboratories and a special Computer Aided Design Interactive Graphics Center which utilizes a VAX 11/780 and various other PDP 11 systems.

The person filling this position will work with senior level administrative, military, and civilian personnel, as well as with midshipmen and faculty users, to develop, implement, and maintain instructional, administrative, and management information systems.

QUALIFICATIONS

Candidates must be able to demonstrate an understanding of and commitment to the special computing needs of a unique institution of higher education. They must have a record which will demonstrate expertise in all aspects related to the management of complex computer and information systems activities. The individual must have the technical skills and knowledge which will allow for effective administration of these activities. Managerial effectiveness will be considered of prime importance in the selection process.

Candidates must have an educational background in computer science, engineering, mathematics or related field. A master's degree is required with the doctorate highly desirable. Candidates should possess a minimum of 7 years of successful data processing experience, including significant administrative and computing experience preferably in an academic environment. It is important for the individual to be able to establish effective working relationships with senior faculty administrators and technical personnel, and be sensitive to the competing demands within an academic institution.

Starting salary will be competitive and commensurate with experience. To receive full consideration nominations and applications should be forwarded no later than 22 October 1983 to:

Major Malcolm W. Fordham, USA
Secretary Search Committee
Computer Science Department
U.S. Naval Academy
Annapolis, Maryland 21402

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SYSTEMS PROGRAMMER Southeast Location

Our company's outstanding growth in a manufacturing field has created an excellent career advancement opportunity for a Systems Programmer. This position includes responsibilities for installation, modification, and tuning of systems software, including MVS, VTAM, JES, ROSCOE and TSO.

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Comp-u-Staff is seeking to hire experienced analyst/programmers to work in Fortune 1000 client accounts. Comp-u-Staff is a growing, professional services company that offers high salaries, performance bonuses, excellent benefits, expense accounts and training programs.

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Continue the sales development momentum for Synapse Computer Corporation — a leading-edge developer of an advanced computer architecture. You'll be selling a high-performance, online system which features concurrent use by a large number of users to a large, integrated relational database. The system is fault tolerant and can range in performance from a super minicomputer and be expanded online & under power to the largest mainframe computers.

Backed by \$26 million in venture capital from the most prestigious firms in the country, Synapse has much to offer the sales professional with a successful track record in the mainframe segment of the computer industry. If you know the D.C. marketplace and understand large online systems, you're looking at top financial rewards. Highly competitive salary base plus incentives and immediate stock options.

•Opportunities also exist in other locations throughout the U.S.

If you're attending the Federal DP Expo, call Chuck Presto, Regional Sales Manager, at 703/448-9294 to schedule an interview.

Or expedite your resume with salary history to Synapse Computer Corporation, Dept. DC Personnel, 801 Buckeye Court, Milpitas, CA 95035. 408/946-3191. An equal opportunity employer m/f/h. Principals only, please.

(From our product ad in this issue, you can justly infer that the "non-Vonn Newmann religion" needs monks!)



Engineering Specialist

Be a part of our high tech industry in the growing sunbelt

Xerox Corporation's Office Products Division, a leader in office automation, has a position in it's Advance Development Department in Dallas, Texas for an Engineering Specialist to plan and direct evaluations of competitive products. Qualified applicants must have the following general credentials:

- Must have a Bachelors degree in Engineering, but prefer MS or equivalent course work in electronics, programming and systems design.
- 10 years of broad engineering experience, 5 of which are in systems design or evaluation. Experience to be primarily in Digital Systems (computers and peripherals).

Must possess the ability to gather information, document findings, organize and maintain databases, analyze and present findings and conclusions verbally or through written reports. The ideal candidate will be tactfully aggressive, a risk taker, self motivated, with good interaction skills.

The person who fills this position will perform literature research, interface with vendors and competitor personnel to compile technology assessments on both hardware and software and work with products planning to help define goals for future products for the division.

If you possess this special blend of personality and technical skills, please forward your resume to: Xerox Corporation, Employment Department, MS 180, Dept. CWCB-912, 1341 W. Mockingbird Lane, Dallas TX 75247. All applicants will receive written or telephone response within 30 days of receipt of resume. Xerox is an affirmative action employer.



Excellence. Innovation. Progress.

Burroughs is a recognized leader in the electronics-based information management industry. We have developed the expertise and capability to become a complete source for a family of products, including computer systems, office automation products and application software — just to name a few.

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Responsible for the design and implementation for a major effort in advanced data management. Requires a strong technical and implementation background in data base technology (minimum 3-7 years). DMSII experience preferred. Opportunities exist in:

- Integrated Data Dictionary
- Query Languages & Data Modeling
- Forms Management & Application Generators
- Data Base Management

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Responsible for the enhancement and support of Burroughs' Generalized Message Control System (GEMCOS). Requires a strong development background and 3-7 years experience in telecommunications monitors, message routing and control systems, or large on-line application development. Knowledge of Burroughs' large systems, GEMCOS, and ALGOL preferred.

Technical Writer

Responsible for researching and writing new user manuals and updating existing user manuals for environmental and system software products. Requires a highly accurate self-starter who is skilled in writing, analysis, interviewing techniques, and identifying customer requirements. A background in communications and computer science, including a degree in Technical Writing, Communications, Computer Science, or Journalism, is also required.

CAD Programming

Responsible for the development and/or selection of of state-of-the-art computer-aided design (CAD) systems. Requires BS/MS in Computer Science or Programming and 1-2 years related experience. Basic familiarity with schematics, PC routers, simulation, and data bases preferred.

Microprogramming

Responsible for the design and implementation of Intel 8086-based applications. Requires 2-3 years experience with the Intel iRMX operating system and Intel languages (Pascal, PL/M, Assemblers).

System Modeling

Responsible for performance modeling and performance evaluation of mainframe systems. Requires 2-3 years experience in computer systems performance modeling.

Systems Software

Responsibilities are on a project basis offering greater opportunity for responsibility and advancement. A BS or MS in Computer Science or related field with one or more years applicable experience preferred. Opportunities exist in:

- Operating Systems
- Computer Network Architecture
- Data Communications
- Interactive Debugging Tools
- Compilers
- Message Control Systems
- Program Generators
- Computer Architecture
- Advanced Data Base Management (Relational and Distributed)
- Distributed Processing & Local & Wide-area Networking

Competitive Evaluation

Responsible for the regular review of publications covering the computer industry, preparing reports on special topics, and providing information and support to members of management and the technical staff. Requires a BS or MS in Management Information Systems, Computer Science or related field, 3-5 years systems or applications programming experience, excellent communication skills and ability to work well in an instructional environment.

Burroughs Systems Development Group in Orange County's Mission Viejo community offers exceptional salaries and benefits. For consideration, please send your resume to:

Burroughs Corporation
Professional Personnel
Dept. CW-0912H
25725 Jeronimo Road
Mission Viejo, CA 92691

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How much is this book worth to you? It is hard to say until you try it. That's why we want you to use it for 10 days; if you are not satisfied, simply return it for a full refund. See how much time it saves you, how it leads you to the gold mine of programming. That's how sure we are that once you use it, nothing could make you part with it. This book will pay for itself over and over, year after year. It is in big 8.5" x 11" size, 280 technique-packed pages.

But act now. Send \$38.50 for 1, (\$32. each for 2, \$30. each for 3, \$28. each for 4 and over) by check or money order to: CCD ONLINE SYSTEMS, INC., P.O. BOX 1170, EULESS, TX 76039. Allow 2 to 4 weeks for delivery.

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MANAGER OF EDP SAUDI ARABIA

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This position will direct day-to-day operations, and be responsible for:

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- Development and Implementation of Long-Term Information Strategy

The high achiever we seek must have strong planning and project management skills, coupled with a demonstrated ability to run his own operation, to spearhead the rapid installation of application software and IBM S38 hardware. It is essential that the candidate have a thorough understanding of the cost-effective application of data processing technology to business. All business applications are designed and implemented using an appropriate mix of custom and packaged software including IBM's DMS. Management experience and a bachelor's degree are mandatory and an advanced degree in computer science is desirable.

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Framingham, MA 01701



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Be responsible for working on an IBM 4341 running VM/CMS and STSC's enhancements to VSAPL, while maintaining APL systems for the Life Controller's and Actuarial Departments. Requires 2-7 years programming experience and 2+ years APL programming. Experience with component file system design, nested arrays, ADRS and micros would be a plus.



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Tower Systems International, a leading supplier of systems software to IBM VSE and MVS users, is looking for an experienced software professional to assume a Systems Engineer position in our Chicago office. This individual will interface with Tower customers in the Midwest, and will be responsible for product installations, product training, and systems support for a large geographic area. Good communications skills and a professional appearance are essential.

A thorough knowledge of VSE, CICS, VSAM, and VM is required. MVS background is a plus, as is systems programming experience. Hands-on exposure to D-FAST, T-FAST, SURVEILLANCE, and/or OMNICALC is preferable.

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MVS/IMS/VTAM/NCP
With at least 5 years experience and knowledge of internals

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9600 De Soto Ave. Dept. 88311CW
P.O. Box 705
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Dataserv Computer Maintenance is expanding nationwide. We now have immediate openings in major cities and will be adding more in the near future.

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For immediate consideration and more information call Toll Free — 800-328-6729 or send your resume to: Bev Walters, Dataserv Computer Maintenance, Inc., P.O. Box 3003, Hopkins, MN 55343. We are an equal opportunity employer and all inquiries are considered confidential.

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C/SCSC Project Leader Data Processing

ITT Avionics is one of the Northeast's principal military electronics firms. We have an immediate opening for an experienced individual to assume the position of C/SCSC Project Leader for MIS.

Candidate should have a degree or the equivalent experience and must possess background in CICS and DL/1 plus 5-7 years data processing experience. Individuals should have participated in DOD C/SCSC readiness reviews and systems validation demonstrations.

Position requires extensive interface and coordination with all division directorates. Individuals should be capable of demonstrating hands-on experience in the design of an automated C/SCSC system in full compliance with AFSCP/AFLCP 173-5 and DOD I 7000.2 and 7000.10 for both development and production contracts.

ITT Avionics provides excellent benefits including tuition assistance, major medical, dental, pensions and investment savings plans and generous relocation. Our location adjacent to NYC provides a unique choice of lifestyles. Qualified candidates should forward resume and salary requirements to Mr. John Dowd, Sr. Placement Representative, ITT Avionics Division, 390 Washington Avenue, Nutley, N.J. 07110

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U.S. Citizenship Required

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AVIONICS DIVISION

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APPLICATION PROGRAMMERS SALARY IN THE 30'S

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You must have experience with RSX11 operating systems, FORTRAN and DEC PDP11 systems in real time environments, similar MODCOMP experience helpful. You must also be a self-starter and be able to function with minimum supervision.

In exchange for your talents we offer in addition to salary, company paid life insurance, Blue Cross-Blue Shield, Medical reimbursement, profit sharing and a ground floor opportunity.

Send resume to:
Attn.: Jim Taylor
QUANTUM COMPUTER INC
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Senior Programmer Analyst

TUNEUP Masters located in Los Angeles area seeks individual with 4-5 years retail applications experience.

Requires IBM mainframe experience utilizing Cobol, CICS, RPG II, DMS, ICCS, VTAME, and DOS/VSE-JCL. Top pay plus profit sharing. Please forward resume including salary history to:

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SYSTEMS ANALYST Communications

Mobil Exploration and Producing Services, Inc., providing advanced geophysical and geological data support to Mobil Oil Corporation's exploration activities worldwide, has an excellent career opportunity for a Computer Systems Analyst. Working in our state-of-the-art Computer Center in Dallas, this professional will be involved in telecommunications subsystems.

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Responsibilities include:

- Provide communications software support for CDC operating systems.
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We can offer an excellent salary, full corporate benefits and the potential for rapid professional advancement. For confidential consideration, send your resume to Professional Employment, Dept. JR-22, 3939 Fabian Way, Palo Alto, CA 94303 or call Joseph Rossi collect at (415) 852-4959. An equal opportunity employer.



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3033 North Central Ave. Suite 401, Phoenix, Arizona 85012

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A position is available for a self-motivated professional with strong interpersonal, communications and computing skills to provide assistance to academic users. Duties include consulting, teaching short courses, preparing documentation and local publications, and providing technical support for computer languages and applications software.

Minimum Qualifications: Bachelor's Degree in appropriate discipline. Two years computing experience, preferably in an academic or user services environment. Knowledge of at least one high-level computer language. Knowledge of IBM operating systems.

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Send letter of application and a current resume to:

Bruce Lewis
Director of Academic
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Division of University Computing
144 Parker Hall
Auburn University, AL 36849
Application Deadline: October 14, 1983
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(214) 934-2350
MIKE HUNTER - 3101 Poplarwood Court
Raleigh, NC 27625 - (919) 872-2940
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Personnel Resources
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Rochester, NY 14650

Kodak. The right place. The right time.
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With last year's exceptional growth rate and 600 new user sites, we are one of the fastest growing divisions of ADP — the world's leading computing services company. We provide major

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To qualify, you must have thorough knowledge of all facets of the data processing industry, 5 years experience in mini or microcomputer hardware and/or software development, 5 years experience in applications design/implementation of business computer systems (preferably within a corporation with a \$1 million plus budget) and at least 2 years formal education or training. Degree in Business Admin. or Computer Science highly desirable. Ability to operate Zenith microcomputer, TRS-100 and TI820 — and new devices as introduced — essential. Extensive travel, and some overtime, will be involved.

ADP is prepared to offer you a generous salary and comprehensive fringe benefits, including stock purchase and tuition aid reimbursement. Take the step today by sending your resume to Jennifer Smith, ADP Collision Estimating, 2380 West Winton Avenue, Hayward, CA 94545. An equal opportunity employer. Females and minorities are encouraged to apply.

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VAX PDP/11 Minicomputer Systems

My client, a suburban Philadelphia chemical company, has positions available within their computer automated labs for creative individuals possessing scientific/computer backgrounds:

Laboratory Automation/Statistics:

Location (Suburban Philadelphia)

Qualified applicants will have a M.S. or higher degree in chemistry, another physical science, statistics or computer science. Individual will have five years of computing experience in the following areas: scientific program design and development, Fortran programming, data base programming, statistical applications to scientific problems. Experience with both PDP & VAX lines of computers, SAS, IMSL, RS/1 desirable. Will be responsible for the design, development and management of laboratory automation systems and also for providing statistics support to the Research & Development function. Successful candidate hired will be developed and provided training for future supervisory responsibilities over a period of years.

Minicomputer Applications and Operations: Location (Houston, Texas)

Qualified applicants will possess an advanced degree in chemistry, another physical science, or computer science, and 3-5 years of industrial programming experience. Extensive experience with the RSX-11M operating system and proficiency in Fortran is also essential. Experience with the VAX line of computers, design and analysis of experiments, instrumental interfacing and/or commercial data base systems is desirable. The individual will provide computer support for our R&D laboratory with specific responsibilities to include management of our PDP 11/44 and 11/34 computers, design and development of laboratory automation systems and scientific programming support of the R&D staff.

Data Base/Operations:

Location (Suburban Philadelphia)

There are two positions available for applicants having experience with commercial data base systems operating on a VAX computer. Qualified applicants will have 3-5 years of industrial experience and hold an M.S. or higher in chemistry, another physical science, or computer science. Both positions require proficiency in Fortran programming and the maintenance and development of data management systems. One position requires a high level of skill in the use of data management tools while the other requires data management skills, knowledge of DECNET, and familiarity with the VMS operating system. Both individuals will be responsible for various aspects of the design, development and management of scientific data base systems operating on a DEC VAX 11/780 computer. This includes integrating these systems with word processing and electronic mail facilities.

Candidates are invited to send detailed resume outlining education, work experience, salary requirements and position of interest to:

George Martin, Executive Search
Doylestown, PA 18901
(215) 348-8146

Equal Opportunity Employer, M/F/H/V

SYSTEMS ANALYST

Expanding state-of-the-art MIS installation of a growing major metal-building manufacturer seeks key individual in the areas of data management and/or manufacturing systems.

You would be responsible for the efficient utilization of Sperry Univac DMS-1100, both for new and existing applications. Requirements include:

- degree in computer science or related field;
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MODEL 204

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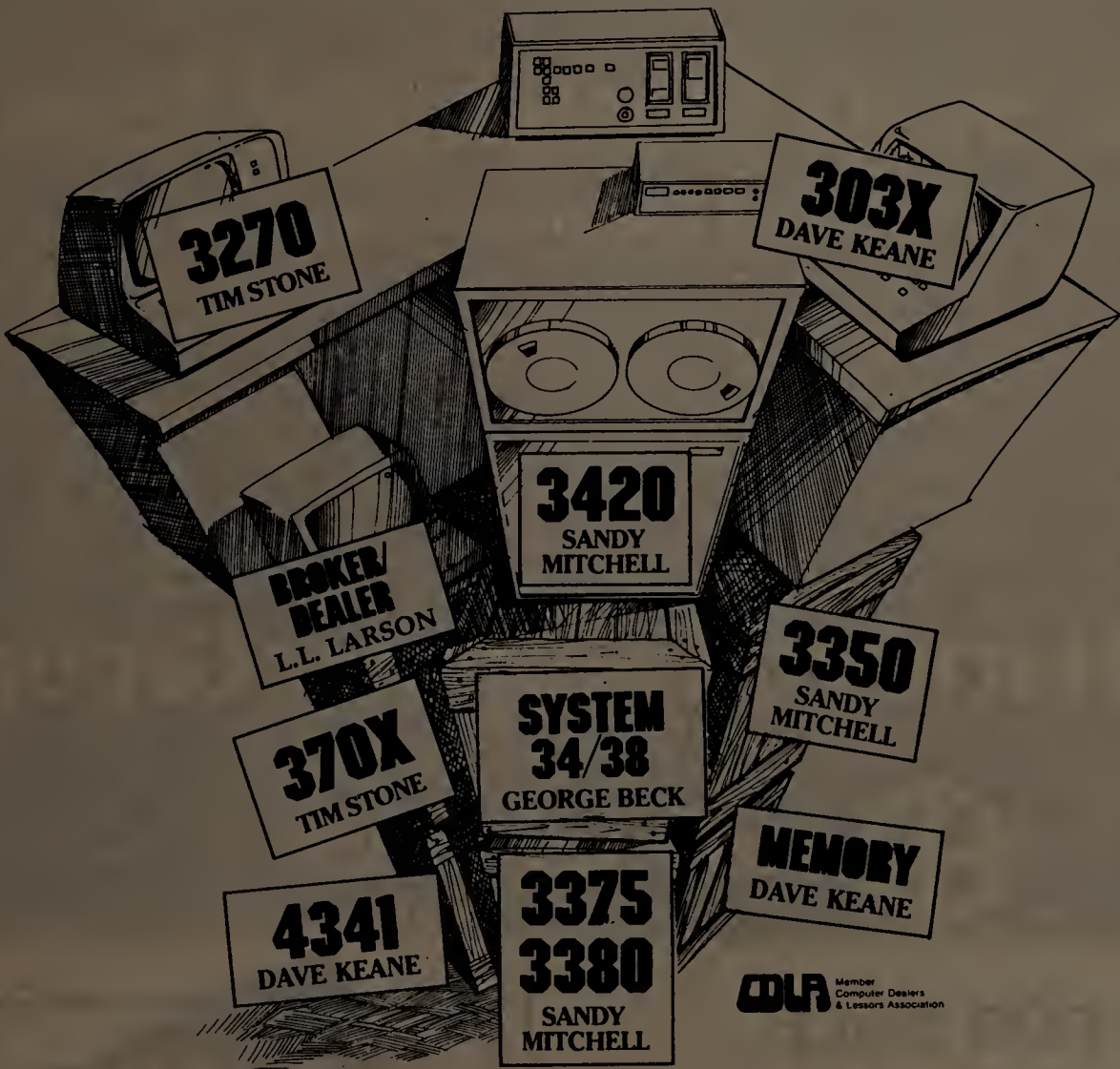
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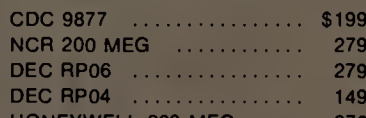

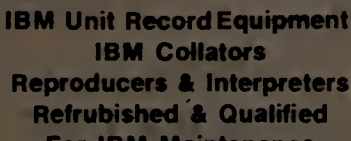









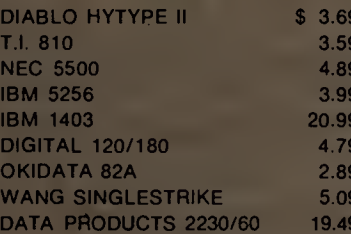
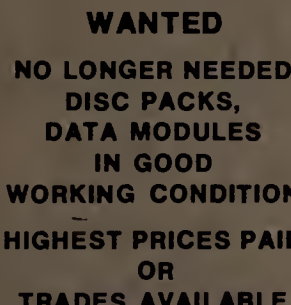

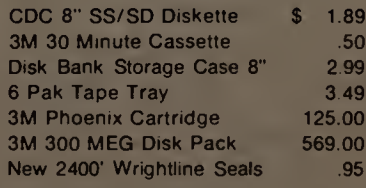
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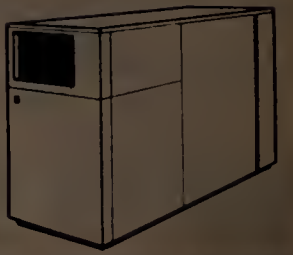
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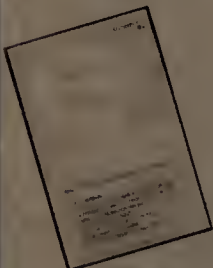
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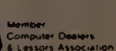
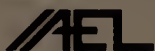
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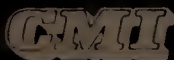
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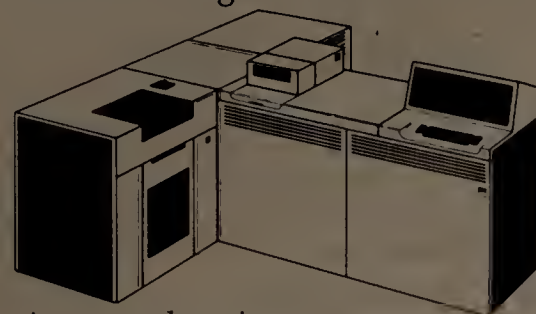
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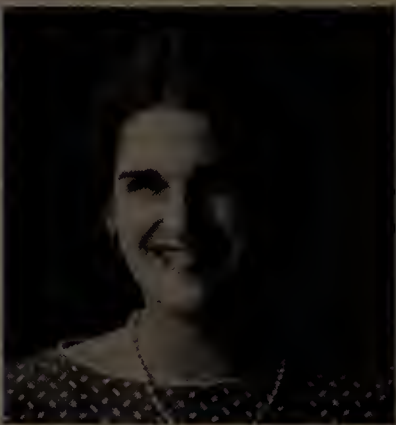
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